



# PCB REMEDIATION PLAN

**Yale University**  
Kline Chemistry  
Laboratory

New Haven,  
Connecticut

225540

**Yale - KCL**

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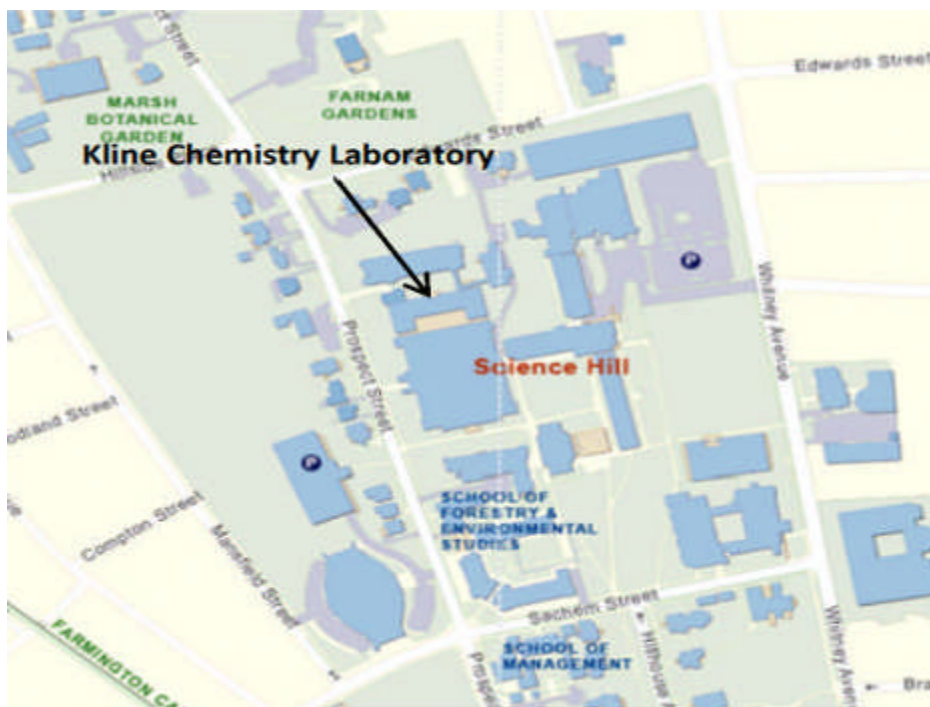
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## 1. INTRODUCTION

This remediation plan has been prepared by Woodard & Curran on behalf of Yale University (Yale) to comply with U.S. Environmental Protection Agency (EPA) requirements for a polychlorinated biphenyl (PCB) cleanup and disposal under 40 CFR Part 761.61. This plan describes the data collected and details the proposed remedial approach for PCB-containing caulking and PCB-impacted building materials to be encountered during planned renovations at the Kline Chemistry Laboratory building located at 225 Prospect Street on the Yale University's New Haven, Connecticut Campus (Figure 1-1).



**Figure 1-1**

The Kline Chemistry Laboratory is an academic building located in the Science Hill area of the Yale Campus. The building was constructed in 1964 and has a footprint of approximately 21,000 square feet with a full basement and two floors with laboratory, classroom, and office spaces. Landscaped and paved areas surround the building; there are courtyards to the north and south of the building. Prospect Street runs to the west of the building, and there are additional academic buildings and a parking area to the east of the building.

### 1.1 CONCEPTUAL SITE MODEL

In preparation for a building renovation and window/door replacement project, a materials survey was conducted to assess for the presence of various hazardous materials that may be encountered during the project. This included inspection and sampling of caulking and sealants for PCBs.

Certain joint caulking used as part of standard construction practices for masonry buildings and concrete structures erected between the 1950's and late 1970's is known to have been manufactured with PCBs. As indicated above, the Kline Chemistry Laboratory was constructed during this timeframe. PCBs were added to caulking for durability, resistance to degradation, and as a softener/plasticizer for application. Due to the porous nature of concrete and

other masonry surfaces, PCBs in caulking may penetrate into adjacent materials during application or over time, may leach or weather, and/or may be disturbed during renovations or other work. Production and approved usage of PCBs was halted in the United States in the late 1970s.

The scope of the planned renovation project includes the following:

- All non-structural interior materials (including ductwork and air handling equipment) are scheduled to be removed;
- The roof top mechanical room penthouses are scheduled for removal;
- Exterior windows and doors are scheduled for replacement including: 84 windows; one curtain wall window; and one main entry way curtain wall door/window system; and
- The removal of a portion of the southern building façade for the installation of a new curtain wall window system that will span from ground level to the roofline.

Interior and exterior window caulking and glazing sealants, door caulking, masonry joint caulking, and ductwork sealant (caulking) were observed during the survey and samples were collected for PCB analysis. Results from the sealant sampling indicated that PCBs were present in some of the caulking/sealant samples at concentrations  $\geq 50$  parts per million (ppm).

Characterization samples of building materials adjacent to the caulking were also collected to assess potential PCB impacts to these materials. Characterization sample results have been used, in conjunction with the overall renovation plan, to develop a two-part remediation plan, which includes: 1) removal and off-site disposal of  $\geq 50$  ppm PCB-containing caulking/sealants, associated window/door frames, ductwork, and other adjacent materials; and 2) in-place management via encapsulating containment barriers of PCB-containing building materials adjacent to the caulking based on the scope of the renovation project (i.e., materials not planned for removal).

Currently the majority of the building is vacant with the remaining staff and students to be relocated prior to work initiation. The overall project schedule calls for the hazardous materials abatement task to be completed as a first component of the project. In order to meet the overall project schedule, this abatement task, including PCB remediation, is scheduled to initiate in October 2012.

Following completion of the renovations, the building will contain classrooms, laboratories, and office spaces.

## 1.2 PLAN ORGANIZATION

This Remediation Plan is organized into the following sections:

### Section 2: Sample Collection, Analyses, and Usability

This section provides a description of the sample collection methods, laboratory testing, and data usability evaluation performed for the samples collected in support of this plan development. Specific details on the results, including data tables, figures, and photographs are not presented in this section, but rather in the individual sections that follow (Sections 5 through 8).

### **Section 3: Remediation Plan Overview**

This section presents an overview of the remedial plans and approaches for the different PCB containing or affected materials to be managed during the project.

### **Section 4: Preparation, Communications, and Controls**

This section presents the site preparation and practices to be implemented prior to and during work activities for the protection of workers and surrounding receptors.

### **Sections 5 through 8: Remediation Plans**

These sections present the characterization data associated with each major material type followed by the proposed remediation and verification processes.

### **Section 9: Waste Storage and Disposal**

This section describes the on-site management of PCB wastes, and lists proposed disposal facilities for off-site transport and disposal of the wastes.

### **Section 10: Conceptual Monitoring and Maintenance Plan**

Given that this plan includes proposed approaches for the in-place management of PCBs, a conceptual monitoring and maintenance plan is provided in this section.

### **Section 11: Site Restoration and Project Schedule**

This section includes a brief summary of the work area restoration as part of the overall renovation project and the anticipated schedule.

### **Section 12: Communication and Documentation**

This section describes the communications between Yale and building occupants and project team members, as well as the project documentation that will be developed as part of the project.

## **1.3 CERTIFICATION**

The following is information regarding the entity submitting this plan:

Yale University  
Environmental Health and Safety  
135 College Street, Suite 100  
New Haven, CT 06510

John Bollier  
Yale University Associate Vice President for Facilities

A copy of the written certification signed by the owner of the property and required as part of this plan submittal is provided in Appendix A.

## **2. SAMPLE COLLECTION, ANALYSES, AND USABILITY**

This section provides a description of the sample collection methods, laboratory testing, and data usability evaluation performed for the samples collected in support of this plan development. Specific details on the results, including data tables, figures, and photographs are not presented in this section, but rather in the individual sections that follow (Sections 5 through 8).

During characterization activities, samples were collected from the following media: caulking, glazing sealants, ductwork sealants, concrete masonry unit (CMU) block, brick, and brownstone in observance of proper sample collection techniques, analytical methods, and reporting procedures.

### **2.1 CHARACTERIZATION SAMPLE COLLECTION**

A total of 86 samples were collected and submitted for PCBs during multiple field events. A breakdown of the samples by media is provided as follows:

- Caulking/Sealant Samples – 31 samples of caulking and sealants were collected and submitted for PCB analysis from windows, doors, the penthouse, and ventilation systems; and
- Adjacent Materials – 55 samples of CMU block, brick, and brownstone were collected from interior and exterior locations and submitted for PCB analysis.

Summaries of the characterization samples collected and analytical results are presented on Tables 2-1 (sealants) and 2-2 (building materials). The locations of the characterization samples are presented on Figures 2-1 through 2-4.

#### **2.1.1 Sample Collection Methods**

Caulking samples were collected by cutting and scraping the material from the joint with hand tools. If adjacent media (e.g., concrete or a foam backer rod) was inadvertently removed in the process of sample collection, this media was physically removed from the caulking before the sample was placed in its sample container.

Building material sampling was conducted in accordance with the USEPA Region I Standard Operating Procedure for Sampling Porous Surfaces for PCBs (May 2011); concrete was ground into dust using a hammer drill to a depth of 0.5 inches into the masonry.

All reusable sampling equipment was decontaminated between each sampling location by scrubbing with a biodegradable soap and water solution (Alconox) followed by a water rinse and a final methanol rinse and allowed to air dry.

#### **2.1.2 Laboratory Analysis**

All samples were logged on standard Chain-of-Custody (COC) forms and stored on ice for delivery to Con-Test Analytical Laboratory of East Longmeadow, Massachusetts or Analytics Environmental Laboratory of Portsmouth, New Hampshire. All samples were extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

The complete laboratory analytical reports for the samples are provided in Appendix B.

## **2.2 CHARACTERIZATION SAMPLE RESULT SUMMARY**

A summary of the characterization sample results by media and reported concentrations is presented in the following sections.

### **2.2.1 $\geq 50$ ppm Caulking/Sealants**

A summary of materials reported to contain  $\geq 50$  ppm PCBs, based on the major material types and work areas in which they were identified, is presented on Table 2-1 and as follows:

- North Side Main Entry – caulking and glazing sealants were identified as follows:
  - Exterior Frame to Masonry and Masonry to Masonry Joints (120 linear feet [l.f.]) – One sample of caulking was collected from the frame to masonry exterior joint. Analytical results indicated that PCBs were present at a concentration of 70,500 ppm; and
  - Glazing Sealants – One sample of glazing sealants was collected from the frame to glass joints on the interior side of the main entry. Analytical results indicated that PCBs were present at a concentration of 6,500 ppm.
- Second Floor Curtain Wall Area Joints (160 l.f.) – Samples of caulking and glazing sealants were not collected from this area due to access restrictions. Based on the similar construction of the curtain wall window and the north side main entry, analytical results from caulking and sealants collected from the north side main entry are to be applied to the second floor curtain wall window sealants;
- Windows (84 windows) – caulking and glazing sealants were identified as follows:
  - Interior Frame to Masonry Joints (vertical joints only; 1,512 l.f.) – Analytical results indicated that PCBs were present at concentrations ranging from 209,000 to 400,000 ppm in the four samples collected;
  - Interior Glazing Sealants – Analytical results indicated that PCBs were present at a concentration of 1,900 ppm in the one sample collected;
  - Exterior Frame to Masonry Joints (horizontal and vertical joints; 2,100 l.f.) – Analytical results indicated that PCBs were present at concentrations ranging from 71,300 to 390,000 ppm in the four samples collected; and
  - Exterior Glazing Sealants – Analytical results indicated that PCBs were present at concentrations of 2,680, 3,060, and 213,000 ppm in the three samples collected.
- Roof Top Penthouses – caulking was identified as follows:
  - Penthouse Doors (3 doors; approximately 50 l.f.) – Analytical results indicated that PCBs were present at a concentration of 490,000 ppm in the sample collected;
  - Penthouse Ventilation Louvers (16 louvers; approximately 144 l.f.) – Analytical results indicated that PCBs were present at a concentration of 730 ppm in the sample collected; and

- Penthouse Parapet Cap (265 l.f.) – Analytical results indicated that PCBs were present at a concentration of 67 ppm.
- Ductwork – A red sealant/coating was identified along metal to concrete joints at wall penetrations points and in metal to metal ductwork joints within the rooftop penthouses, the interior building spaces overhead areas, and the basement mechanical spaces. Analytical results indicated that PCBs were present at concentrations ranging from 31 to 3,000 ppm in the nine samples collected.

### 2.2.2 < 50 ppm Caulking

As indicated on Table 2-1, caulking identified as containing PCBs < 50 ppm has been identified in three locations:

- Building Parapet Cap Joints (175 l.f.) – Two samples of caulking were collected from the south building elevation parapet wall scheduled for removal as part of the renovation project. Caulking was observed along the brownstone cap to flashing joint (150 l.f.) and along the brownstone to brownstone cap joints (25 one-foot long joints). Analytical results indicated that PCBs were present at concentrations of 2.0 and 33 ppm. During sample collection no other caulking or caulk residue were observed in the joint. The initial sampling frequency was based on the initial project scope which included the removal of the building parapet cap along the southern building elevation only. A revised project scope includes the replacement of all portions of the building parapet cap (approximately 800 l.f. parapet cap). Based on the recent change in project scope, two additional samples of the caulking will be collected prior to project implementation to confirm total PCBs < 50 ppm in this sealant type;
- Roof Top Penetrations – Two samples of caulking surrounding rooftop penetrations associated with the building ventilation support structures were collected. Analytical results indicated that PCBs were non-detect (< 0.95 ppm) in one sample and present at a concentration of 1.4 ppm in the second sample collected; and
- Interior CMU Control Joints (1 joint; 9 l.f.) – One sample of caulking collected from the single observed interior CMU control joint was collected and reported PCBs as non-detect (< 0.87 ppm).

Based on this information, Yale has determined that these caulking materials meet the definition of an Excluded PCB Product per 40 CFR 761.3. The project specifications prepared for the renovation project will identify these specific materials as having detectable concentrations of PCBs at these levels for management and disposal purposes. If analytical results from the additional building parapet wall caulking samples indicated that PCBs are present at concentrations  $\geq 50$  ppm, the building parapet wall will be remediated as described for the penthouse parapet wall included in Section 7 of this plan.

### 2.2.3 Adjacent Building Materials

A total of 55 samples of building materials were collected to determine the extent of PCBs from caulking/sealants identified as containing  $\geq 50$  ppm PCBs. Additional details of the building material sampling, including analytical results and locations of samples, are presented in subsequent sections of this plan. Summaries of the samples collected and the analytical results are presented on Table 2-2. Locations of the adjacent building material samples are presented on Figures 2-1 through 2-4.

## 2.3 DATA USABILITY ASSESSMENT

This data quality and data usability assessment has been conducted to review the caulking/sealant and building material samples collected to date in support of the characterization activities.

Data validation and review of samples was conducted by both Woodard & Curran and a third-party validator, Data Check, Inc. of New Durham, New Hampshire. This review included a check of field documentation including sample collection and preservation methods, a check of the laboratory data and documentation, a review of the internal laboratory QA/QC procedures and results including surrogate recoveries, blank results, laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) results, and an evaluation of sample holding times and field duplicate results. Data validation summary is provided in Appendix B.

A summary of the data usability assessment is presented below:

- All samples analyzed for PCBs were extracted and analyzed within technical holding times. No qualifications were applied to the data;
- Some samples were analyzed at dilutions due to the high concentrations of PCBs present in the samples and/or due to the sample matrix. Elevated quantitation limits (laboratory reporting limits) are reported in these samples as a result of the dilutions performed;
- The PCB method blanks were non-detect (ND) for all target analytes with the exception of the Aroclor 1254 method blank result for laboratory report 68098. No qualifications were applied to the data because the concentration of Aroclor 1254 in all associated samples was greater than the blank action concentration;
- One field equipment blank sample was collected for equipment used for the collection of masonry samples and submitted to the laboratory as part of the field QA/QC procedures. The blank sample was ND for the target analytes. No qualifications were applied to the data;
- Results of the matrix spike/matrix spike duplicate (MS/MSD) samples met acceptance criteria with the exception of percent recoveries for Aroclor 1260 in sample KCL-CBC-015. Aroclor 1260 results for sample KCL-CBC-015 were not qualified based on Aroclor interferences in the primary sample;
- Accuracy of the analytical data was assessed by reviewing LCS/LCSD and surrogate recoveries. The recoveries for both surrogates and LCS/LCSD sample results met acceptance criteria. No qualifications were applied to the data;
- Two field duplicate samples were collected and submitted to the laboratory as part of the field QA/QC procedures. RPD between the primary and duplicate samples met the acceptance criteria and no qualifications were applied to the data;
- Due to continuing calibration non-conformance, the lower of the two column results was reported for Aroclor 1254 in samples KCL-CBR-039 and field duplicate KCL-CBRD-041. The data is still usable for the intended purposes given that total PCBs were reported at concentrations > 25 ppm and final extent of encapsulation will be based on the limits of PCBs > 1 or 25 ppm as demonstrated through verification sample collection;
- The Relative Percent Difference (RPD) between the column results met the acceptance criteria ( $\leq 25\%$ ) with the exception of the Aroclor 1248 (KCL-CBK-017), Aroclor 1254 (KCL-CBK-003, KCL-CBB-021, KCL-CBR-023, KCL-CBC-212, KCL-CBC-213, and KCL-CBC-214 [duplicate sample]), and Aroclor 1260 (KCL-VBC-205). Aroclor 1248, Aroclor 1254, and Aroclor 1260 results for these samples have been qualified as

estimated (J), as applicable. RPD results for detected PCBs in laboratory reports 12F0342, 09800337, and 09800339 were not available; no qualifications were applied;

- Representativeness of the data was evaluated qualitatively utilizing site information and sampling data. Samples were extracted and analyzed within the allowable holding times. Consistent procedures and laboratory analysis of the data were achieved. Samples were accompanied by complete chain of custody forms from the time of sample collection until laboratory delivery. PCBs were not detected in the method blank analysis, indicated that there were no interferences introduced at the laboratory or during sample analysis;
- Samples associated with laboratory reports 12F0342, 09800337, 09800339, 68098, 68444, and 68983 were received at temperatures above six degrees Celsius. All associated sample results were qualified J/UJ; and
- The data packages were reviewed to ensure that all sample and associated quality assurance results were available. The completeness review indicated that all samples were analyzed and all quality control results were available to complete the data validation process.

Based on a review of the collective data set, the data adequately represents the materials tested. The characterization data is of sufficient quality for the purposes of characterizing PCB-affected media in accordance with 40 CFR 761 and for use in developing the remediation plan presented herein.



### 3. REMEDIATION PLAN OVERVIEW

This plan has been developed for the remediation of the PCB-containing sealants and PCB-impacted building materials that will be disturbed during the Kline Chemistry Laboratory renovation project. A general overview of the proposed remedial activities is presented below with detailed descriptions of the plan for each of the affected media presented in the following sections.

The remediation plan proposed herein is a combination of a removal and off-site disposal of PCB bulk product waste under 40 CFR 761.62 with a risk-based cleanup and disposal request prepared in accordance with 40 CFR Part 761.61(c) for PCB remediation wastes (CMU block, brick, concrete, etc.).

In summary, all caulking and sealants containing  $\geq 50$  ppm PCBs encountered/disturbed within the work area will be removed and disposed off-site as a  $\geq 50$  ppm PCB waste. Window frames and components (including glass) coated with  $\geq 50$  ppm PCB sealants will also be removed for off-site disposal as  $\geq 50$  ppm PCB waste.

Building materials scheduled for removal (interior CMU block walls, penthouse building materials, ventilation ductwork, etc.) will be removed and segregated for disposal as either  $\geq 50$  ppm PCB wastes,  $< 50$  ppm PCB Remediation waste, or general demolition debris following a cut-line approach. The location of the cut-line will be based on results of verification sampling. To the extent practical, verification samples will be collected prior to implementation of the project to confirm the location of the cut-line as described in the following sections.

Residual concentrations of PCBs in building materials not scheduled for removal (i.e., the majority of exterior brick and brownstone) are proposed to be contained through the application of a liquid coating and managed in-place to prevent direct contact with PCBs and/or potential migration effects to other media. The rationale for this decision is that the removal or scarification of these materials could result in structural damage to the building and result in significant aesthetic changes to the architectural appearance of the building (for example, brownstone construction). Building material removals would also result in the need for extensive re-configurations not planned for this renovation project that would change the historic appearance of the building.

The applicable cleanup criteria for materials remaining on the building will be assigned as follows:

- Interior Locations and Exterior First Floor Locations – High occupancy cleanup criteria of 1 ppm; and
- Exterior Second Floor Locations – Low occupancy cleanup criteria of 25 ppm.

The use of the low occupancy cleanup criteria at exterior second floor locations is based on the 40 CFR 761.3 definition of this type of occupancy and the low potential for direct contact with these materials given that there is no access to exterior portions of the second floor via balconies, doors, or other access points.

The in-place management of PCB remediation waste is an interim solution designed to shield impacted materials from the effects of weathering and leaching mechanisms, thereby eliminating potential exposure pathways and mitigating the potential for PCB transfer via direct contact and/or leaching to other media/materials. Accordingly, there will be no resultant exposure to PCBs and the remnant PCBs will not present a risk to human health or to the environment. Proper disposal of any remaining PCBs in building materials will be required upon removal of the material or at the time of structure demolition.

A summary of the remedial approach for the caulking and building materials is presented on Table 3-1. An overall summary of the verification samples and frequency is presented as Table 3-2. Detailed discussions on the proposed remediation and verification are presented in the following sections.

## **4. PREPARATION, COMMUNICATIONS, AND CONTROLS**

Prior to initiating any of the remediation activities, the following activities will be implemented.

### **4.1 PREPARATION AND COMMUNICATIONS**

- A Health & Safety Plan will be developed for the specific work activities to be conducted. Workers will follow applicable Federal and State regulations regarding the work activities, including but not limited to OSHA regulations, fall protection standards, respiratory protection, ladder/scaffolding safety, personal protective equipment (PPE), etc.
- Additional notifications and plans required for the work activities, including the preparation and submittal of a Contractor Workplan following Contractor selection, will also be prepared and submitted for approval, as needed.
- The work is scheduled to be conducted when the entire building is vacant; however, prior to initiation and periodically during the work activities, project-related communications with University staff and contractors will be undertaken on an as needed basis.

### **4.2 CONTROLS**

- Access to the active work areas will be restricted by fencing and signage with controlled access points.
- To reduce particulate levels and exposures to airborne particulates, a combination of engineering controls (e.g., work zone enclosures, polyethylene sheeting, HEPA filtration, wetting, etc.) and PPE will be implemented as part of the work activities.
- Polyethylene sheeting will be placed within the work areas including on scaffolding and lifts used to access the work areas. Wet wiping and water misting will be used as a dust suppressant as appropriate. No grinding or saw cutting will be used for caulking removal.
- Dust monitoring will be conducted in accordance with Appendix C during active dust generating removal activities. Based on the engineering controls to be implemented and the minimal amount of disturbance to the caulking required for caulking removal, dust monitoring will not be conducted when only caulking and window/doors are being removed.
- Ground cover (polyethylene sheeting or equivalent) will be placed along the building walls to serve as containment for any debris or building materials that may fall during removal activities. Any debris collected on the polyethylene sheeting will be gathered and placed in the appropriate containers at the end of each work day. After use, disposable PPE and poly sheeting used to collect debris will be placed in the appropriate containers for disposal as PCB remediation waste as described in Section 9.
- Wet wiping, spraying, and/or vacuuming of tools and equipment in the work area will be performed at the completion of the work activity. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79.

## 5. NORTH SIDE MAIN ENTRY AND SECOND FLOOR CURTAIN WALL WINDOW SYSTEMS

This section presents the characterization data and proposed remediation plans associated with north side main entry and second floor curtain wall window systems.

The north side main entry and second floor curtain wall window systems are scheduled for removal as part of the renovation project. Following removal, the openings for each will be filled in with brick and smaller individual windows to match the rest of the elevation.

### 5.1 CHARACTERIZATION

Characterization samples of caulking, glazing sealants, and adjacent building materials were collected from the main entry doorway. Approximately 40 l.f. of caulking was identified along the exterior frame to brick vertical joints (20 l.f.) and the upper horizontal frame to brownstone ceiling joint (20 l.f.). Caulking was also observed along brownstone to brownstone masonry joints on the overhang ceiling in front of the door (80 l.f.). No caulking was observed along the lower horizontal joint between the frames and the bluestone decking. Caulking was not observed along interior joints. Analytical results indicated that PCBs were present at a concentration of 70,500 ppm in the exterior caulking and at a concentration of 6,500 ppm in the window glazing sealants.



Access to the exterior side of the second floor curtain wall window system was not available at the time of characterization. No caulking or glazing sealants were observed on the interior side of the window. Based on similar physical construction, it is assumed that caulking along the exterior frame to masonry joints of the second floor curtain wall window (including the lower horizontal frame to terrazzo floor joint) contains PCBs  $\geq 50$  ppm. This includes a total of approximately 40 l.f. of caulking along brick joints (includes frame to brick vertical joints [20 l.f.] and horizontal brick wall to terrazzo floor joints [20 l.f.]), 100 l.f. of caulking along brownstone joints (includes the upper horizontal frame to brownstone ceiling joint [20 l.f.] and the brownstone to brownstone ceiling joints [80 l.f.]), and 20 l.f. of caulking along the exterior frame to terrazzo floor joint.

Characterization samples of building materials were collected to determine the extent of PCBs  $> 1$  ppm for waste segregation purposes. A summary of the samples collected and the analytical results is as follows:

- Two samples of exterior brick were collected at a distance of four inches from the vertical caulked joints. Analytical results indicated that PCBs were non-detect in both samples ( $< 0.43$  and  $< 0.48$  ppm); and
- One sample of brownstone ceiling was collected at a distance of six inches from the upper horizontal caulked joint. Analytical results indicated that PCBs were non-detect ( $< 0.48$  ppm).

Summaries of the caulking and building material characterization sampling results are presented on Table 2-1. The locations of the samples are depicted on Figure 2-2.

## 5.2 REMEDIATION

The remedial approach for the north side main entry and the second floor curtain wall window systems is described below. The approach is a material removal and segregation approach through the establishment of a cut-line for segregation of materials as either  $\geq 50$  ppm PCB wastes or general demolition debris (i.e., PCBs  $\leq 1$  ppm).

$\geq 50$  ppm PCB Containing Caulking and Sealants and Coated Door/Window Components – Caulking, glazing sealants, backer materials, and coated door/window components (including glass) associated with the north side main entry and second floor curtain wall window system will be removed for disposal as  $\geq 50$  ppm PCB waste to a hazardous waste disposal facility.

Refer to Section 6 for additional details on the removal procedures.

Adjacent Building Materials – Building materials within the project work area will be removed as follows (pre-removal verification samples to be collected as described on Section 5.3 to confirm extent):

- Brick Walls –
  - The first half-row of bricks along vertical caulked joints (i.e., materials formerly in direct contact with and to a distance of approximately four inches from the joint) will be removed for disposal as  $\geq 50$  ppm PCB wastes;
  - The first row of bricks along horizontal floor to wall caulked joints (i.e., materials formerly in direct contact with and to a distance of approximately 3 inches above the joint) will be removed for disposal as  $\geq 50$  ppm PCB wastes;
  - Remaining brick materials will be removed and segregated for disposal as general demolition debris based on results of verification sampling (see below); and
  - All  $\geq 50$  ppm PCB wastes will be disposed of at a hazardous waste disposal facility.
- Brownstone Ceiling – Based on the limited volume of materials associated with the brownstone ceiling, the overhang ceiling will be removed in its entirety for disposal as  $\geq 50$  ppm PCB waste to a hazardous waste disposal facility; and
- Terrazzo Floor – Floor materials formerly in direct contact with and to a distance of eight inches from the caulked joints to be removed for disposal as  $\geq 50$  ppm PCB wastes to a hazardous waste disposal facility. This distance was selected based on discussions with the project team regarding anticipated methods of removal and based on results from terrazzo floor sampling conducted at the Kline Geology Laboratory in 2011 which indicated that PCBs  $> 1$  ppm were present at distances of up to 1.25 inches from the caulked joint. Samples for delineation of PCBs were not collected as part of this plan preparation because there is not currently access to the exterior portion of the building at this location. As indicated below, verification samples will be collected prior to removal. Remaining floor materials (beyond the cut-line) will be removed and segregated for disposal as general demolition debris in accordance with the project specifications.

## 5.3 BUILDING MATERIAL VERIFICATION SAMPLING

Prior to removal of any  $\geq 50$  ppm PCB wastes from the building, verification samples will be collected from brick and terrazzo floor materials to verify the extent of PCBs  $> 1$  ppm as follows:

- Brick – Verification samples will be collected as follows:
  - Vertical Frame to Brick Joints – Samples to be collected from the first full row of bricks away from the caulked joint (i.e., immediately past the first half-row of brick or approximately four inches from the joint) at a frequency of 1 sample per 20 l.f. of caulked joint. Based on a total of 40 l.f. between the first and second floors, a total of two samples will be required; as indicated previously, the samples from the north side main entryway have already been collected; and
  - Horizontal Floor to Brick Joints - Samples to be collected from the second row of brick above the joint (approximately four inches from the joint) at a frequency of 1 sample per 20 l.f. of caulked joint for a total of one sample.
- Terrazzo Floor – Verification samples will be collected at a distance of eight inches from the caulked joint along the frame to floor joint and the frame to brick joints at a frequency of 1 sample per 20 l.f. for a total of 2 samples.

Analytical results will be compared to the unrestricted use criteria of 1 ppm for waste segregation purposes. If results indicated that PCBs are present at concentrations > 1 ppm, additional verification samples will be collected at distances further from the respective joints to delineate the extent of PCBs > 1 ppm and the cut-line will be adjusted based on results of the testing. A summary of the verification sampling plan is provided on Table 3-2.

Refer to Section 9 for the waste storage and disposal procedures for the materials.

## **6. BUILDING WINDOWS ON EXTERIOR FAÇADES**

This section presents the characterization data and remediation plans associated with the windows scheduled to be removed and interior and exterior building materials in direct contact with and away from the caulked frame to masonry joints.

### **6.1 WINDOW FRAMES AND COMPONENTS**

As part of the initial inspection, an inventory of windows was conducted. As shown on Figures 2-2 and 2-3, there are a total of 84 windows with dimensions of approximately 2.5 ft. by 9 ft. located on the first and second floor of the building.

#### **6.1.1 Characterization**

Caulking is present on interior and exterior metal frame to masonry vertical joints and exterior horizontal joints. Glazing sealants are present along interior and exterior frame to glass joints.

Caulking and glazing sealant samples were collected from various locations throughout the building to determine the concentrations of PCBs in the caulking and sealants. The sample locations were spatially distributed throughout the work area and collected from interior and exterior locations. A total of eight caulking samples and four glazing sealant samples were collected as presented on Table 2-1.

As indicated on Table 2-1, all samples detected PCBs at concentrations > 50 ppm ranging from 1,900 ppm in the interior window glazing sealant sample to 400,000 ppm in one of the interior window caulking samples. Based on these results, window caulking and glazing sealants encountered will be managed as  $\geq 50$  ppm PCB wastes.

#### **6.1.2 Remediation**

The caulking and window removal task described below involves the removal and off-site disposal of the caulking and window glazing sealant encountered as well as the associated window frames and components (including glass) during the performance of the window replacement project.

- Removal of the majority of the caulking will be done during window removal. Windows will be removed as single units with minimal size reduction performed as required for safe management and handling and/or waste disposal facility requirements;
- For building materials scheduled to remain in place, residual caulking will be removed using hand tools or electric caulking removal tools to achieve caulking removal to the maximum extent practicable while minimizing dust or other airborne particulates generated from caulking or adjacent materials. There will be no grinding or saw cutting of caulking. Upon the completion of caulking removal activities, the joints will be visually inspected for the presence of any residual caulking. If residual caulking is observed, it will be removed from the adjacent material to the maximum extent practicable;
- For building materials scheduled to be removed, no additional caulking removal will be conducted following window removal. Residual caulking will be removed with the adjacent building materials (brick, brownstone, etc.) for off-site disposal as  $\geq 50$  ppm PCB waste (see subsequent sections);
- Wet wiping and/or vacuuming of all tools and equipment in the work area will be performed at the completion of the work activity;

- During the project, equipment and tools used in the removal process will be decontaminated through spraying and wet wiping. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79;
- Any debris collected on the polyethylene sheeting will be gathered and placed in the  $\geq 50$  ppm PCB waste containers at the end of each work day. After use, disposable PPE and poly sheeting used to collect debris will be placed in the appropriate containers for disposal as PCB waste;
- All removed caulking, window frames and components (including glass), and associated debris will be transported for off-site disposal as  $\geq 50$  ppm PCB wastes to a hazardous waste disposal facility; and
- Following completion of removal activities, the work area will be cleaned through HEPA vacuuming and wet wiping in preparation for the application of the liquid sealant, where needed.

Refer to Section 9 for the waste storage and disposal procedures for the materials.

## 6.2 INTERIOR BUILDING MATERIALS ADJACENT TO WINDOWS

This section presents the characterization data and remediation plans associated with interior CMU walls adjacent to interior window caulking.

### 6.2.1 Characterization

The interior building walls adjacent to the windows consist of CMU block. The windows are installed in a recess ranging from 15 to 18 inches from the face of the interior building wall. Caulking containing PCBs  $\geq 50$  ppm is present along both vertical metal window frame to CMU joints. Caulking is not present along the horizontal joints.

Characterization samples of CMU block within the window recess were collected from distances of one, seven, and ten inches away from the caulked joints at four window locations. Results of the sampling are summarized below and indicated decreasing levels with distance from the caulked joint:

- 1 inch from the caulked joint – Analytical results indicated that PCBs were present at concentrations of 10.5 and 13.5 ppm;
- 7 inches from the caulked joint – Analytical results indicated that PCBs were present at concentrations of 1.34 and 1.56 ppm; and
- 10 inches from the caulked joint – Analytical results indicated that PCBs were present at concentrations of 0.893, 0.777, 2.2, and 3.8 ppm.



Characterization samples of CMU block were also collected immediately after the window recess (i.e., at distances of either 15 or 18 inches from the caulked joints) at four locations. Analytical results indicated that PCBs were present at concentrations of 1.46, 1.50, 4.12, and 4.42 ppm.

To confirm that other sources of PCBs were not contributing to PCBs at concentrations  $> 1$  ppm, additional characterization samples of CMU block (0 to 0.5 inch depth) were collected from locations with no physical relationship to interior caulking (i.e., from areas without windows or caulking such as hallways and in the basement).

The location of the samples and the analytical results were as follows:

- Basement Level –Analytical results indicated that PCBs were < 1 ppm in four samples collected from CMU within hallways and rooms with total PCBs reported at concentrations of 0.15, 0.36, 0.84, and 0.95 ppm;
- First Level – Analytical results indicated that PCBs were present at concentrations of 0.71 and 0.89 ppm in samples collected from first floor hallways; and
- Second Level – Analytical results indicated that PCBs were present at a concentration of 0.70 ppm in a sample collected from the second floor hallway.

Based on these results, PCBs reported in characterization samples at concentrations above the unrestricted use clean up level are considered attributable to the caulking located on the interior window frame to masonry joints.

Characterization samples of CMU block were also collected to confirm the surficial nature of the PCB impacts and to provide analytical data of the waste stream for waste disposal purposes. A summary of the samples and the analytical results is as follows:

- Four samples of CMU block were collected at a depth of 0.5 to 1.0” from the surface of the block at first and second floor locations. Analytical results indicated that PCBs were < 1 ppm in all four samples with total PCB concentrations of 0.34, 0.38, 0.54, and 0.68 ppm; and
- Two core samples of the entire width of the CMU block were collected. Analytical results indicated that PCBs were present at concentrations of 0.74 and 1.3 ppm.

A summary of the characterization sample results is included on Table 2-2. The locations of the samples are depicted on Figures 2-1, 2-2, and 2-3.

## **6.2.2 Remediation**

All interior non-structural materials are scheduled for removal as part of the overall building renovation project. To support this project scope, a materials segregation/materials management strategy was developed for CMU materials. Under this approach, CMU materials will be removed and segregated for disposal as  $\geq 50$  ppm PCB wastes, < 50 ppm PCB wastes, and general demolition debris following a cut-line approach as follows:

- $\geq 50$  ppm PCB Wastes – The first row of CMU block materials (i.e., the row of block in direct contact with caulked joints; approximately 20 cubic yards (yd<sup>3</sup>) of materials) are to be removed for disposal as  $\geq 50$  ppm PCB wastes to a hazardous waste disposal facility;
- < 50 ppm PCB Wastes – CMU block materials located beyond the first row of block (approximately 115 yd<sup>3</sup> of materials) are to be removed through a cut-line approach for disposal as < 50 ppm PCB wastes to a non-hazardous waste disposal facility. Based on the limited distance between windows (typically eight feet), the extent of removal as < 50 ppm PCB wastes will include all CMU between windows and will extend to a defined boundary or “break point” such as door openings, or interior 90-degree angles where there is no additional caulking (see Figures 6-1 and 6-2). This “point” will be confirmed through verification sampling (see Section 6.2.3); and
- Pending verification results, the remaining CMU block materials will be removed for disposal as general demolition debris.

The extent of CMU block materials to be removed as PCB wastes are depicted on Figure 6-1 and 6-2.



### 6.2.3 Interior Building Material Verification Sampling

CMU block materials are to be removed for off-site disposal as either  $\geq 50$  ppm PCB wastes, as  $< 50$  ppm PCB wastes, or as general demolition debris. No additional samples are proposed to be collected to confirm the location of the cut-line between  $\geq 50$  ppm PCB wastes and  $< 50$  ppm PCB wastes. This approach is supported by the existing data set and the planned disposal of CMU block beyond this point as  $< 50$  ppm PCB waste. The existing data set includes 12 characterization samples collected from six locations at varying distances from the caulked joint, which indicated that PCBs were present at concentrations up to 13.5 ppm. Of the 12 samples, ten were collected beyond the first row of CMU block with analytical results indicating that PCBs ranged from 0.777 to 4.42 ppm, well below 50 ppm. This corresponds to an overall sample frequency of one sample per 14 windows.

Verification samples are to be collected to confirm the cut-line between  $< 50$  ppm PCB wastes and general demolition debris. Verification samples will be collected from CMU block materials immediately past proposed cut-lines at a frequency of 1 sample per 50 l.f. of cut-line. Analytical results will be compared to the unrestricted use criteria of 1 ppm for waste segregation purposes. If results indicated that PCBs are present at concentrations  $> 1$  ppm, additional verification samples will be collected at further distances to delineate the extent of PCBs  $> 1$  ppm and the cut-line will be adjusted based on results of the testing.

In total, 9 verification samples are proposed to be collected. The location of each verification sample will be selected by randomly selecting a number from zero to nine (based on the length of the caulked joint and typical CMU wall height) with the zero point assigned to the bottom of the wall.

A summary of the proposed verification sampling plan is provided on Table 3-2.

## 6.3 EXTERIOR BUILDING MATERIALS ADJACENT TO WINDOWS – SCHEDULED FOR REMOVAL

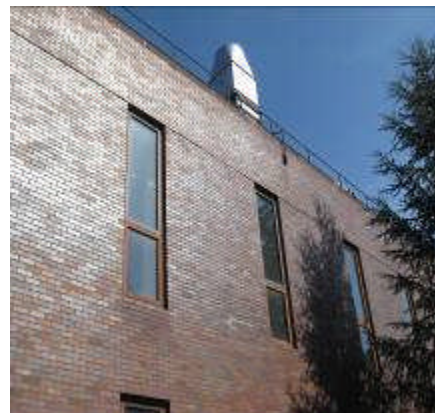
This section presents the characterization data, remediation plans, and verification process associated with exterior brick materials surrounding windows in the southern courtyard area scheduled to be removed for the installation of a curtain wall window system.

### 6.3.1 Characterization

Brick surrounding the 36 south courtyard windows is scheduled for removal to allow for the installation of the courtyard curtain wall window system. The windows are recessed approximately three to four inches from the face of the building. Caulking containing PCBs  $\geq 50$  ppm is present along all vertical and horizontal metal window frame to brick joints.

Characterization samples of brick were collected from four locations as summarized below:

- Two samples were collected at a distance of  $\frac{1}{2}$ -inch from the edge of the window recess along the vertical joint (approximately 4 inches from the joint). Analytical results indicated that PCBs were non-detect ( $< 0.48$  and  $< 0.091$  ppm); and



- Two samples were collected at a distance of 3" below the edge of the lower horizontal window recess (approximately 6" from the caulked joint). Analytical results indicated that PCBs were non-detect (< 0.091 ppm) and present at a concentration of 0.64 ppm.

A summary of the characterization sample results is included on Table 2-1. The locations of the samples are depicted on Figures 2-2. Based on these results, a remedial plan for the removal and segregation of exterior brick materials through a cut-line approach was developed.

### **6.3.2 Remediation**

Brick materials in the southern courtyard will be removed and segregated for disposal as either  $\geq 50$  ppm PCB wastes or general demolition debris following a cut-line approach as follows:

- Vertical Joints – The first half-row of brick away from the recess (i.e., formerly in direct contact with the caulking and to a distance of approximately 4 inches from the caulked joint) will be removed for disposal as  $\geq 50$  ppm PCB wastes to a hazardous waste disposal facility;
- Horizontal Joints – The first full row of brick above and below the window recess (i.e., formerly in direct contact with the caulking and to a distance of approximately 6 inches from the caulked joint) will be removed for disposal as  $\geq 50$  ppm PCB wastes to a hazardous waste disposal facility; and
- All remaining brick materials will be removed for disposal as general demolition debris provided verification samples are  $\leq 1$  ppm.

The location of the cut-line will be verified through the collection of verification brick samples prior to implementation as described in the following section.

### **6.3.3 Exterior Building Material Verification Sampling**

Verification samples will be collected from brick materials to verify the extent of PCBs > 1 ppm. Verification samples will be collected from bricks as follows:

- Vertical Joints – Samples will be collected immediately past the first half-row of brick away from the edge of the recess; and
- Horizontal Joints – Samples will be collected from the second row of brick below the edge of the recess (all samples associated with horizontal joints are to be collected below the lower horizontal joint based on an assumed "worse-case" migration down the face of the building).

Verification samples will be collected at a sample frequency of approximately 1 sample per 50 l.f. of caulked joint. There is approximately 25 l.f. of exterior caulked joints per window; therefore, a total of 18 samples will be collected.

The location of each verification sample will be selected as follows:

- The individual joint will be randomly selected; and
- The location on the selected joint will be selected by randomly selecting a number between zero and nine (vertical joints) or zero and three (lower horizontal joints) with the zero point assigned to the bottom of vertical joints and the left end of the lower horizontal joint.

Analytical results will be compared to the unrestricted use criteria of 1 ppm for waste segregation purposes. If results indicated that PCBs are present at concentrations > 1 ppm, additional verification samples will be collected at distances further from the respective joints to delineate the extent of PCBs > 1 ppm and the cut-line will be adjusted based on results of the testing.

## 6.4 EXTERIOR BUILDING MATERIALS ADJACENT TO WINDOWS – TO REMAIN IN PLACE

This section presents the characterization data, remediation plans, and verification process associated with exterior building materials that are scheduled to remain in place following the removal of the 48 windows on the north, east, and west elevations.

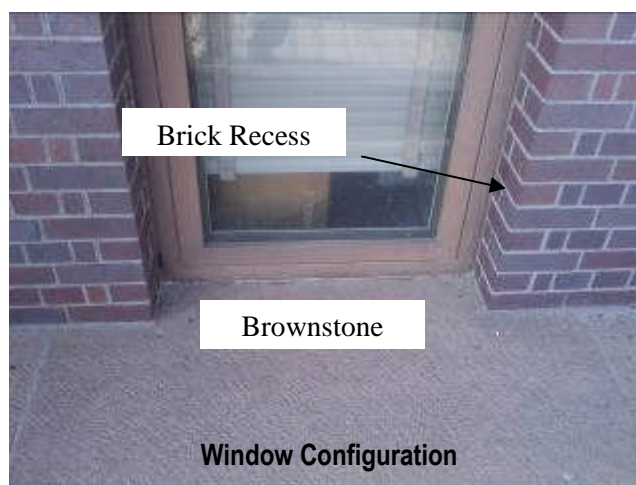
### 6.4.1 Characterization

Exterior building materials adjacent to windows consist of brick and brownstone. A summary of each of the materials and the characterization data collected from each follows.

#### 6.4.1.1 Brick

Brick materials are located along vertical joints of each window. Samples of brick were collected from the face of brick materials perpendicular to the building face within the window recess at distances of one and three inches from the caulked joints. A total of six brick samples were collected for characterization purposes. A summary of the analytical results is as follows:

- 1 inch from the caulked joint – Three samples were collected and analytical results indicated that PCBs were present at concentrations of 0.615, 2.9, and 4.1 ppm; and
- 3 inches from the caulked joint – Three samples were collected and analytical results indicated that the concentration of PCBs were < 1 ppm (0.045, 0.11, and 0.22 ppm).



The locations of the samples are depicted on Figure 2-2.

#### 6.4.1.2 Brownstone Sills

Brownstone sills are located above and below each of the windows and extend approximately 24 inches from the window frames. Up to three samples of brownstone were collected from four locations at distances of one, three, and ten inches from the lower horizontal caulked joint. A summary of the analytical results is as follows:

- 1 inch from the caulked joint – Four samples were collected and analytical results indicated that PCBs were present at concentrations of 2.6, 7.9, 8.2, and 10 ppm;
- 3 inches from the caulked joint – One sample was collected and analytical results indicated that PCBs were present at a concentration of 0.855 ppm; and

- 10 inches from the caulked joint – Three samples were collected and analytical results indicated that PCBs were present at concentrations < 1 ppm (0.23, 0.29, and 0.63 ppm).

The locations of the samples are depicted on Figure 2-2.

#### 6.4.2 Remediation

As discussed previously, bricks and brownstone at these windows are not scheduled to be removed during the renovation project. To address residual levels of PCBs in these materials following caulking and window removal, an in-place management program will be applied to these materials to prevent direct contact exposure and migration of PCBs outside the existing PCB limits. The in-place management of building materials will be conducted through the application of liquid coatings to materials formerly in direct contact with  $\geq 50$  ppm caulking and to materials away from the joint containing PCBs greater than the applicable occupancy criteria.

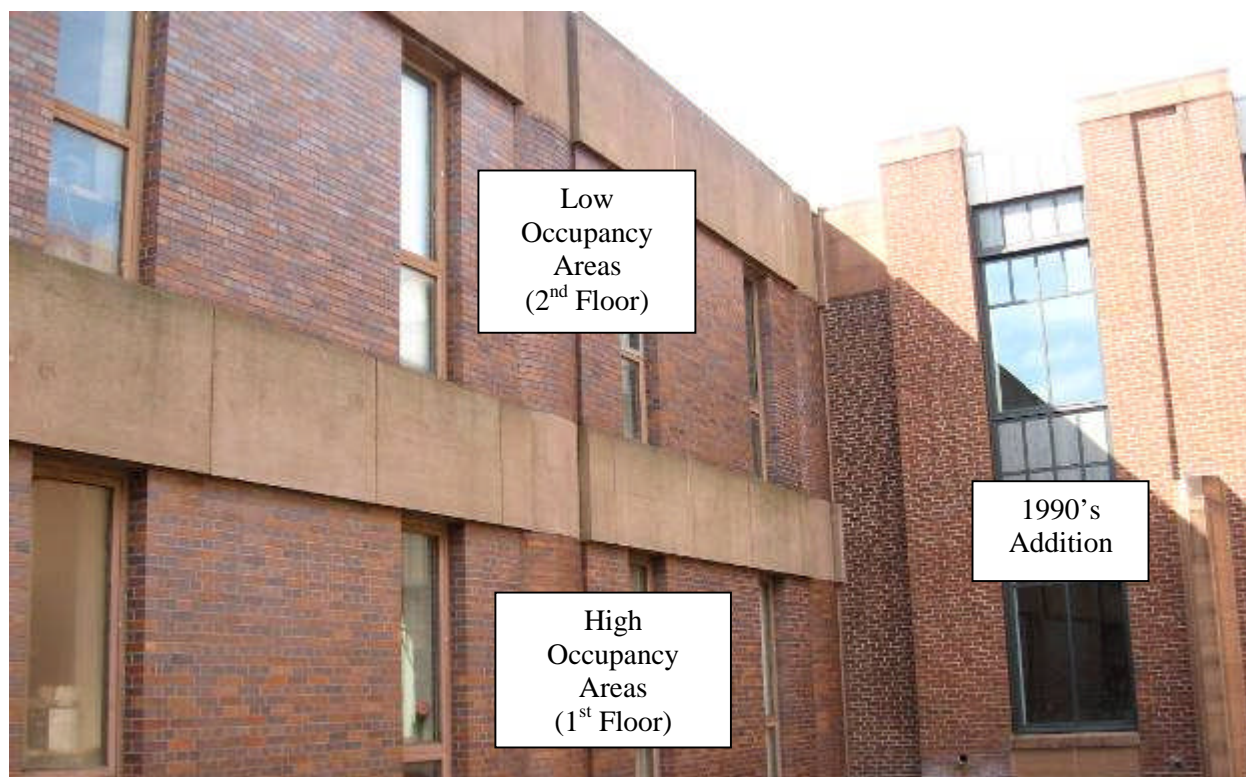
Materials formerly in direct contact with the caulking and those to be covered by the replacement window frames and caulking will be coated with two coats of a liquid epoxy coating (i.e., Sikagard 62 liquid epoxy coating [see Appendix D for manufacturer's product information], or equivalent product).

Materials away from the joints containing PCB greater than the applicable use criteria will be coated with two coats of a clear coating, penetrating sealer, or equivalent product compatible for exterior brick/brownstone coating (i.e., Sikagard 670W clear [see Appendix D for manufacturer's product information], or equivalent product). As with the Kline Geology Project in 2011, preservation of the architectural nature and aesthetics of the building is critically important and a driving factor for product selection. For this project, the specific product to be selected for this application will also be determined based on mock-ups to be performed by the project team during the initial phases of the project. Regardless of the product selected, verification of the effectiveness of the product to contain PCBs will be evaluated through the verification wipe sampling program detailed below.

Based on the differing potential for direct contact exposures, both a high occupancy and low occupancy cleanup criteria will be applied to the bulk delineation samples collected as follows:

- High Occupancy Cleanup Criteria: The high occupancy cleanup criteria of  $\leq 1$  ppm total PCBs will be applied to all first floor building materials. The cleanup criteria is applicable due to the location of the windows within ten feet of the ground surface; and
- Low Occupancy Cleanup Criteria: The low occupancy cleanup criteria of  $\leq 25$  ppm total PCBs will be applied to building materials adjacent to windows on the second floor locations. The application of the low occupancy criteria to these locations is based on their location and use which limits direct contact exposure to these materials given the limited to no access and that the selected replacement windows are inoperable.

The photograph below provides examples of where the applicable criteria are to be applied:



**North Building Elevation**

#### 6.4.2.1 Additional Delineation Sampling

The extent of sealant application will be subject to modification based on the results of additional delineation sampling to be conducted prior to application. Samples will be collected as follows:

- Brick:

High Occupancy Areas (First Floor Locations – 24 window locations): Verification brick samples will be collected at the end of the window recess away from the caulked joint and proposed encapsulation area (see Section 6.4.2.2) to verify the extent of PCBs > 1 ppm. Verification samples are to be collected at a sample frequency of 1 sample per 100 l.f. of caulking. There is approximately 19 l.f. of caulking next to brick per window; therefore, five samples will be collected. At each selected window, the sample location along the joint will be randomly selected using a random number generator based on the total linear footage of the caulked joints; and

- Low Occupancy Areas (Second Floor Locations – 24 locations): Verification brick samples will be collected at a distance of one inch from the caulked joint from an area beyond the proposed encapsulation area (see Section 6.4.2.2) to verify that PCBs > 25 ppm are not present beyond the extent of the replacement windows and caulking. Verification samples are to be collected at a sample frequency of 1 sample per 100 l.f. of caulking (5 samples). At each selected window, the sample location along the joint will be randomly selected using a random number generator based on the total linear footage of the caulked joints.

- Brownstone Sills:
  - High Occupancy Areas (First Floor Locations – 24 locations): Verification brownstone samples will be collected at a distance of 10 inches from the caulked joint from an area beyond the proposed encapsulation area to verify the extent of PCBs > 1 ppm. Verification samples are to be collected at a sample frequency of 1 sample per 50 l.f. of caulking. There is approximately 6 l.f. of caulking next to brownstone on each window; therefore, three samples will be collected. At each selected window, the sample location along the joint will be randomly selected using a random number generator based on the total linear footage of the caulked joints; and
  - Low Occupancy Areas (Second Floor Locations – 24 locations): Verification samples will be collected at a distance of one inch from the caulked joint from an area beyond the proposed encapsulation area to verify that PCBs > 25 ppm are not present beyond the extent of the replacement windows and caulking. Verification samples are to be collected at a sample frequency of 1 sample per 50 l.f. of caulking (3 samples). At each selected window, the sample location along the joint will be randomly selected using a random number generator based on the total linear footage of the caulked joints.

If results of the sampling indicate that PCBs are present at concentrations above the applicable cleanup levels, additional samples will be collected at the frequencies detailed above to delineate the extent of PCB impacts above the cleanup level and to establish the required extent of the barrier coating / sealant.

#### 6.4.2.2 Encapsulant Application

The application of the liquid coating/sealant will be performed following removal of the PCB-containing caulking and windows and under the same containments and controls used for the window removals. Access to the work areas will remain restricted through the use of barrier markers and signage. Access to the work areas will be through aerial lift, staging, or from the interior of the building.

Twenty four windows are located within the high occupancy area and 24 windows are located in the low occupancy designated areas. Around all 48 windows, brick materials formerly in direct contact with the  $\geq 50$  ppm PCB caulking and to be covered by the replacement windows and new caulking will be coated with two coats of epoxy (approximately  $\frac{1}{4}$ " beyond current exterior caulking).

Surrounding the 24 windows in the high occupancy areas, brick materials beyond the extent of epoxy application to the end of the window recess (i.e., a distance of approximately three or four inches depending on the size of the recess) will be coated with two coats of a clear coating or penetrating sealant.

For those windows identified within the low occupancy area, if the verification sample results are  $\leq 25$  ppm, then no additional sealant will be applied to the brick surfaces away from the joint. If results of the verification samples indicate that PCBs > 25 ppm are present, additional verification samples will be collected and the liquid coating/sealant will be applied to materials identified as containing PCBs above the low occupancy criteria.

Brownstone sills and headers are present along 24 windows within the high occupancy areas and 24 windows within the low occupancy areas. Around all 48 windows, brownstone materials formerly in direct contact with the  $\geq 50$  ppm PCB caulking and to be covered by the replacement windows and new caulking will be coated with two coats of epoxy (approximately  $\frac{1}{4}$ " beyond current exterior caulking).

Surrounding the 24 windows in the high occupancy areas, all materials beyond the extent of epoxy application to the end of the sill/header (approximately 24 inches) will be coated with two coats of a clear acrylic or penetrating sealant.



For those windows identified within the low occupancy area, if the verification sample results are  $\leq 25$  ppm, then no additional sealant will be applied to the brownstone surfaces away from the joint. If results of the verification samples indicate that PCBs  $> 25$  ppm are present, additional verification samples will be collected and the liquid coating/sealant will be applied to materials identified as containing PCBs above the low occupancy criteria.

### **6.4.3 Verification Wipe Sampling**

Following application of the sealant, verification baseline wipe samples will be collected from materials formerly in direct contact with the exterior caulked joint and from materials away from the caulked joint. Wipe samples will be collected following the standard wipe test procedures described in 40 CFR 761.123. Details of the sampling program are presented in the following sections.

#### **6.4.3.1 Former Direct Contact Areas**

Verification wipe samples of sealed building materials formerly in direct contact with the caulked joints will be collected to evaluate the effectiveness of the sealant. A summary of the verification sample frequency for each building material is provided below:

- Brick (48 windows) – Verification wipe samples collected from sealed brick materials formerly in direct contact with the exterior caulking will be collected at a sample frequency of 1 sample per 100 l.f. of caulking next to brick for a total of 10 samples ( $48 \times 19 \text{ l.f.} = 912 \text{ l.f.}$ ); and
- Brownstone (48 windows) – Verification wipe samples collected from sealed brownstone materials formerly in direct contact with the exterior caulking will be collected at a sample frequency of 1 sample per 50 l.f. of caulking next to brownstone for a total of 6 samples ( $48 \times 6 \text{ l.f.} = 288 \text{ l.f.}$ ).

#### **6.4.3.2 Materials Away from the Joint**

Verification wipe samples of sealed building materials adjacent to the former caulked joint will be collected to evaluate the effectiveness of the sealant. A summary of the verification sample frequency for each of the building materials is provided below:

- Brick (24 High Occupancy Windows) – Brick materials adjacent to caulked joints are to be sealed on a total of 24 first floor windows. Verification wipe samples will be collected at a sample frequency of 1 sample per 100 l.f. of caulking next to brick for a total of 5 samples ( $24 \times 19 \text{ l.f.} = 456 \text{ l.f.}$ ); and
- Brownstone (24 High Occupancy Windows) – Brownstone materials adjacent to caulked joints are to be sealed on a total of 24 first floor windows. Verification wipe samples will be collected at a sample frequency of 1 sample per 50 l.f. of caulking next to brownstone for a total of 3 samples ( $24 \times 6 \text{ l.f.} = 144 \text{ l.f.}$ ).

At this time, liquid sealant application is not anticipated at low occupancy areas. However, if applied then verification wipe samples will be collected at the same frequency as the high occupancy areas.

Results from wipe samples collected from sealed surfaces adjacent to the windows (i.e., areas of clear coat application) will be compared to the standard as follows:

- $\geq 1 \mu\text{g}/100\text{cm}^2$  – Additional coat of liquid sealant may be applied and verification sample re-collected at an off-set location depending on product specifications for coating/sealant layers; and
- $< 1 \mu\text{g}/100\text{cm}^2$  – No further action.

## 7. ROOFTOP PENTHOUSE EXTERIOR BUILDING MATERIALS

This section presents the characterization data, remediation plans, and verification process associated with sealants identified on exterior locations of the rooftop penthouse. The entire rooftop penthouse is scheduled for removal as part of the overall building renovation project.

### 7.1 CHARACTERIZATION

Characterization samples of caulking were collected from the penthouse doors, the penthouse ventilation louvers, and the penthouse parapet cap. Analytical results indicated that PCBs were present at concentrations  $\geq 50$  ppm. A summary of the caulking identified on the penthouse is as follows:

- Approximately 50 l.f. of caulking was observed along the vertical and upper horizontal penthouse door frame to brick joints (3 doors);
- Approximately 144 l.f. of caulking was observed along the vertical and upper horizontal penthouse ventilation louver frame to brick joints (16 locations); and
- Approximately 265 l.f. of caulking was observed along the stone to flashing joints and stone to stone joints of the penthouse parapet cap.



**Penthouse Door  
(typical)**



**Penthouse Parapet Cap**

One characterization sample of brick was collected at a distance of four inches from the penthouse door caulked joint. Analytical results indicated that PCBs were non-detect ( $< 0.091$  ppm). One sample of brick was collected at a distance of four inches from the vertical louver caulked joint. Analytical results indicated that PCBs were non-detect ( $< 0.095$  ppm).

Summaries of the caulking and building material characterization sampling results are presented on Table 2-1. The locations of the samples are depicted on Figure 2-4.



## 7.2 REMEDIATION

The remedial approach for the penthouse doors, louvers, and parapet cap is described below. The approach is a material removal and waste material segregation approach through the establishment of a cut-line for segregation of materials as either  $\geq 50$  ppm PCB wastes or general demolition debris (i.e., PCBs  $\leq 1$  ppm).

$\geq 50$  ppm PCB Containing Caulking and Sealants, Door/Louver Components, and Parapet Cap Components – Caulking, backer materials, door/louver components associated with penthouse doors, louvers, and parapet cap brownstone and flashing materials will be removed for disposal as  $\geq 50$  ppm PCB waste to a hazardous waste disposal facility. Refer to Section 6 for additional details on the removal procedures.

Adjacent Building Materials – Building materials within the project work area will be removed as follows (pre-removal verification samples to be collected as described in Section 7.3 to confirm extent):

- Brick Walls Associated with Doors and Louvers –
  - The first half-row of bricks along vertical caulked joints (i.e., materials formerly in direct contact with and to a distance of approximately four inches from the joint) and the first row of brick along horizontal joints will be removed for disposal as  $\geq 50$  ppm PCB wastes to a hazardous waste disposal facility; and
  - Remaining brick materials will be removed and segregated for disposal as general demolition debris pending results of verification sampling (see below).
- Parapet Cap Materials – Based on the limited volume of materials associated with the parapet cap, parapet cap materials including brownstone cap, metal flashing, and bricks directly below the lateral caulked joints will be removed for disposal as  $\geq 50$  ppm PCB waste to a hazardous waste disposal facility.
- Metal Flashing below Louvers – Metal flashing directly below each louver and to a distance of six inches from the louvers will be removed for disposal as  $\geq 50$  ppm PCB waste to a hazardous waste disposal facility. All remaining metal flashing will be removed for disposal as general demolition debris pending results of verification sampling (see below).

## 7.3 BUILDING MATERIAL VERIFICATION SAMPLING

Prior to removal of any  $\geq 50$  ppm PCB wastes from the roof penthouse, verification samples will be collected from brick and materials to verify the extent of PCBs  $> 1$  ppm as follows:

- Penthouse Doors – Verification samples to be collected at a frequency of 1 sample per door (3 samples) to be collected immediately past the first half-row of brick away from the vertical joints (approximately 4 inches from the joint). No samples are proposed to be collected above the doors based on potential worst-case migration of PCBs laterally away from vertical joints.
- Penthouse Louvers (16 locations) – Verification samples to be collected immediately past the first half-row of brick away from the vertical joints (approximately 4 inches from the joint) at a frequency of 1 sample per 50 l.f. of caulking. There is approximately 9 l.f. of caulking next to brick per louver; therefore, three samples will be collected. At each selected louver, the sample location along the joint will be randomly selected using a random number generator based on the total linear footage of the vertical caulked joints (no samples are proposed to be collected above the louvers based on potential worst-case migration of PCBs laterally away from the vertical joints).
- Parapet Cap Joints – Verification samples to be collected at a frequency of 1 sample per 10 joints at the beginning of the second row of brick below the lateral stone to stone cap joint (total of 6 samples).

- Penthouse Louver Metal Flashing (16 locations) – Verification wipe samples to be collected at a distance of six inches from the base of the vertical caulked joints at a frequency of 1 sample per 50 l.f. of caulking. There is approximately 9 l.f. of caulking per louver; therefore, three samples will be collected.

Analytical results will be compared to the unrestricted use criteria of 1 ppm (brick samples) or 10  $\mu\text{g}/100\text{cm}^2$  (metal flashing) for waste segregation purposes. If results indicated that PCBs are present at concentrations above these levels, additional samples will be collected at distances further from the respective joints to delineate the extent of PCBs > 1 ppm or 10  $\mu\text{g}/100\text{cm}^2$ , as applicable, and the cut-line will be adjusted based on results of the testing.

Refer to Section 9 for the waste storage and disposal procedures for the materials.

## 8. VENTILATION SYSTEM COMPONENTS AND DUCTWORK

This section presents the characterization data, remediation plans, and verification process associated with sealant/coating identified on metal to metal and metal to concrete joints of the ventilation ductwork at the rooftop penthouses, basement mechanical spaces, and in overhead areas within the building and on metal to metal joints within the ventilation system components in the basement mechanical spaces.



All ventilation system components and ductwork is scheduled for removal as part of the overall building renovation project.

### 8.1 CHARACTERIZATION

During the site inspection and inventory, a red sealant was observed on ductwork along metal to concrete and metal to metal joints in the penthouses, interior building spaces, and the basement mechanical spaces:

- Roof Top Mechanical Penthouses – Sealant was observed along metal to metal joints of the ductwork and along the metal to CMU block joints at approximately 36 wall penetration points.
- Interior Building Spaces Overhead Areas – Interior spaces have two main ventilation trunks located in the overhead areas (approximately 10 to 12 feet above the floor). The two trunks come together into a single ventilation system at mixing junction boxes approximately six to eight feet from wall penetrations. The

typical configuration is presented on Figure 8-1. Where flexible ductwork was observed, sealant was present along metal to concrete joints at wall penetration points in the basement floor, first floor, and second floor spaces and along metal to metal joints of the ductwork between the wall penetration and the junction boxes. A total of 92 wall penetrations (joining into 46 junction boxes) were observed to have the red sealant on the joints. In areas without flexible ductwork and in ventilation components beyond the junction boxes, metal to metal joints were observed to be gasket materials.

- Basement Mechanical Spaces – Sealant was observed along metal to metal joints of the ductwork and ventilation system components in the east and west mechanical spaces. Due to accessibility issues within the basement mechanical spaces, the number and location of joints containing the sealant is not known at this time. However, the project scope includes the removal of all ductwork and ventilation system components and the remediation strategy presented below has been developed to be scalable to the amount of sealants or number of joints to be encountered.

Characterization samples of sealants and building materials were collected as follows:

- Six characterization samples of the red sealant/coating were collected. Analytical results indicated that PCBs were present at concentrations ranging from 58.9 to 3,000 ppm.
- One characterization sample was collected from interior CMU block materials within the roof top penthouse at a distance of six inches below the sealant at a wall penetration point. Analytical results indicated that PCBs were non-detect ( $< 0.087$  ppm).

## **8.2 PILOT TEST ACTIVITIES**

In order to evaluate whether or not PCB impacts were present in underlying concrete materials at wall penetration points, a pilot test was conducted at three interior locations. At each location, all visible sealant was removed from the concrete under negative pressure controls and HEPA filtrations. Sealant was removed using an electric oscillating removal tool (Fein SuperCut). Once all visible sealant was removed, one sample of concrete was collected from each pilot test area. Analytical results indicated that PCBs were present at concentrations of 0.75, 1.1, and 6.5 ppm.

In addition, to support an overall waste material segregation approach, an evaluation of whether or not PCBs had migrated within the ductwork sealant beyond the location of the red sealants was conducted. Wipe samples of the ductwork were collected within the mixing junction boxes immediately beyond the last observed location of red sealant. Three wipe samples were collected on the interior vertical side wall of the box. Analytical results indicated that PCBs were reported as non-detect (2 samples at  $< 0.20$   $\mu\text{g}/100\text{cm}^2$ ) and at a concentration of  $0.34$   $\mu\text{g}/100\text{cm}^2$ . Wipe sample results are presented on Table 8-1.

## **8.3 REMEDIATION**

For the metal ductwork and adjacent CMU block, the remedial approach is a material removal and waste material segregation approach through the establishment of a cut-line for segregation of materials as either  $\geq 50$  ppm PCB wastes or general demolition debris (i.e., PCBs  $\leq 1$  ppm for CMU block or  $\leq 10$   $\mu\text{g}/100\text{cm}^2$  for metal ductwork). For concrete wall materials scheduled to remain in place surrounding the wall penetration points, the remedial approach is to remove all materials impacted by PCBs  $> 1$  ppm through physical removal method (i.e., grinding, chipping, etc.) with a contingency for in place management via encapsulation if this level cannot be achieved (given that additional concrete removal beyond the initial depth cannot be conducted due to structural concerns). A summary of the approach is as follows:

≥ 50 ppm PCB Containing Sealants – PCB containing ductwork sealants will be removed for disposal as ≥ 50 ppm PCB waste to a hazardous waste disposal facility. For the rooftop penthouse metal to CMU joints and metal to metal joints building wide, removal of the sealant will be conducted as part of the CMU block and metal ductwork removal. For sealant on the concrete scheduled to remain in place surrounding wall penetration points, the sealant will be removed through grinding or chipping of the sealant and coated concrete to a depth of ¼”.

Concrete Materials – Concrete materials in direct contact with the sealant and to a depth of ¼” will be removed for disposal as ≥ 50 ppm PCB wastes through physical methods (e.g., grinding or chipping). All other concrete materials will remain in place based on the project scope (potentially under an encapsulant coating – see below).

Roof Top Penthouse CMU Block – Interior CMU block at wall penetrations within the rooftop penthouses formerly in direct contact with the sealant and to a distance of six inches from the sealant will be removed for disposal as ≥ 50 ppm PCB waste to a hazardous waste disposal facility. Remaining CMU block materials will be removed for disposal as general demolition debris pending results of verification sampling described below.

Metal Ductwork – Ductwork in direct contact with the sealant and to the distances described below will be removed with the sealants for off-site disposal as ≥ 50 ppm PCB waste to a hazardous waste disposal facility. Remaining ductwork materials will be segregated for disposal as general demolition debris. The segregation approach is as follows:

- Roof Top Penthouse Ductwork – Due to the number and location of joints, all ductwork will be removed for disposal as ≥ 50 ppm PCB wastes (i.e., no waste segregation) to a hazardous waste disposal facility;
- Interior Overhead Spaces – Ductwork materials from the wall penetrations to the mixing junction boxes will be removed for disposal as ≥ 50 ppm PCB wastes to a hazardous waste disposal facility. Pending verification sample results (see below), all remaining ductwork will be removed for disposal as general demolition debris; and
- Basement Mechanical Spaces – The ventilation system component and ductwork cut-line will be established at a distance of six inches from the joints based on the anticipated methods for waste segregation and verified through wipe sampling of materials beyond the cut-line. In support of this cut-line location, verification wipe samples will be collected prior to project implementation as described below. Portions of the materials may be removed for disposal in their entirety as ≥ 50 ppm PCB wastes (i.e., no waste segregation) if the number and location of joints do not support waste segregation.

## **8.4 BUILDING MATERIAL VERIFICATION SAMPLING**

To the extent practical, verification samples will be collected prior to removal. A summary of the verification sampling programs for concrete materials and ductwork is described in the sections below.

### **8.4.1 Concrete**

Following removal of the ductwork and concrete materials in direct contact with the sealants to a depth of ¼”, verification samples of underlying concrete will be collected at a frequency of 1 sample per every 10 penetrations for a total of 10 samples. Verification sample locations will be randomly selected based on the total length of application at the selected penetration point with the lower left hand corner assigned zero and proceeding clockwise around the removal area. Results of the verification samples will be compared to the high occupancy cleanup standard of ≤ 1 ppm as follows:

- Total PCBs > 1 ppm – Concrete materials formerly in direct contact with sealant to be encapsulated using two coats of a liquid epoxy coating (Sikagard 62, or equivalent product) following the procedures described

in Section 6 of the plan. Verification wipe samples to be collected of encapsulated surfaces at the same frequency as the bulk samples; and

- Total PCBs  $\leq$  1 ppm – No additional action, removal complete.

#### **8.4.2 CMU Block**

Verification samples of CMU block in the penthouses will be collected at a distance of six inches from the caulked joint. Samples are to be collected at a frequency of 1 sample per 10 penetrations for a total of four samples including the sample already collected. Results of the verification sampling will be compared to the high occupancy clean up standard as follows:

- Total PCBs  $>$  1 ppm – Additional verification sample collected at a greater distance from the sealant and the segregation location adjusted accordingly; and
- Total PCBs  $\leq$  1 ppm – Waste segregation conducted as described above.

#### **8.4.3 Ductwork**

Verification wipe samples of metal ductwork will be collected as follows:

- Rooftop Penthouse Area – No verification samples to be collected, all ductwork to be removed for disposal as  $\geq$  50 ppm waste due to the number and location of joints;
- Interior Spaces Overhead Areas – Verification wipe samples will be collected from inside the mixing junction boxes at a frequency of 1 sample per 5 junction boxes (total of 10 wipe samples); and
- Basement Mechanical Spaces – Verification wipe samples will be collected from ventilation system components and ductwork materials at a distance of six inches from the sealant at a frequency of approximately 1 sample per 100 l.f. of joints. This proposed sample frequency is based on the amount of sealant observed in currently accessible areas and may be modified based on amount of sealant identified when the full inventory is completed. Samples will be collected immediately past the cut line as follows:
  - The side of the joint will be alternated between the left and right;
  - The center point of the wipe will be randomly selected along the selected seam; and
  - At the selected location, the wipe will be collected in a 10 cm by 10 cm area immediately outside the cut line.

Results from the verification wipe samples will be compared to the high occupancy cleanup standard for non-porous materials as follows:

- $\geq$  10  $\mu\text{g}/100\text{cm}^2$  – Additional verification wipe sample to be collected further from the joint and the cut line extended to the next sample point in either direction that meets the level; and
- $<$  10  $\mu\text{g}/100\text{cm}^2$  – No additional action.

## 9. WASTE STORAGE AND DISPOSAL

Caulking containing  $\geq 50$  ppm PCBs, backing materials, window frames and components (including glass), and backing materials and other materials (brick, brownstone, ductwork, etc.) in direct contact with the caulking and removed to the specified cut-lines described in this plan will be managed as a single waste stream and designated as  $\geq 50$  ppm PCB wastes. Building materials scheduled for removal and impacted by PCBs at a concentration  $> 1$  ppm will be removed for disposal as either  $\geq 50$  ppm PCB wastes or  $< 50$  ppm PCB wastes as described in the previous sections. Polyethylene sheeting, PPE, and other disposable equipment and tools will be managed for disposal as  $< 50$  ppm PCB wastes.

The following activities will be completed with regard to the proper storage and disposal of PCB wastes:

- Secure, lined, and covered waste containers (roll-off containers or equivalent), 55-gallon DOT-approved steel containers, or cubic yard boxes/totes will be staged for the collection of PCB wastes generated during the work activities in accordance with 40 CFR 761.65;
- Containers will be properly labeled and marked in accordance with 40 CFR 761.40;
- Upon completion of the work or when a container is considered full, PCB waste  $\geq 50$  ppm will be transported off-site under manifest, for disposal at a hazardous waste disposal facility (EQ Wayne Disposal Facility located in Belleville, Michigan, or equivalent);
- Upon completion of the work or when a container is considered full, PCB waste  $< 50$  ppm will be transported off-site for disposal at a non-hazardous waste landfill permitted to accept such wastes (Waste Management's Turnkey Landfill located in Rochester, New Hampshire, or equivalent); and
- At the end of their use on the project, non-disposable tools and equipment will be decontaminated in accordance with 40 CFR 761.79. Decontamination fluids generated during the work will be collected/contained and managed/disposed in accordance with 40 CFR 761.79.

Copies of the waste shipment records, including manifests and certificates of disposal, will be collected and provided as part of the final report to EPA.

## 10. CONCEPTUAL MONITORING AND MAINTENANCE PLAN

As described in this plan, remediation activities to be completed will require implementation of a remedial approach under 40 CFR 761.61(c). This approach removes source materials and utilizes a physical barrier approach (liquid coating or sealant followed by new window frames in some locations) to eliminate the direct contact exposure pathway and migration pathways of PCBs remaining on the building. Upon completion of the remedial actions, the impacted building materials would not be accessible to direct exposure or migration to surrounding building materials.

Following implementation of this approach, a monitoring and maintenance plan (MMP) will be developed and implemented. The main components of the plan are as follows:

- Visual inspections – Visual inspections of the coated/sealed surfaces will be conducted. The inspections will consist of an assessment of the following:
  - Signs of the underlying coating, or excessive pitting, peeling, or breakages in the coating;
  - Signs of weathering or disturbance of the replacement caulking (where applied); and
  - A general inspection of the joints.
- Surface Wipe Sampling – Surface wipe samples will be collected from the sealed surfaces at a frequency developed based on the final areas to be encapsulated. Wipe samples will be collected following the standard wipe test procedures described in 40 CFR 761.123 and/or an alternate proposed method;
- Corrective Actions – If results of the inspections indicate that damage has occurred to a component of the barrier system or if monitoring results exceed project-specific action levels (to be developed in the MMP), the needed repairs or corrective actions will be conducted;
- Maintenance Guidelines and Procedures – To prevent potential exposure to maintenance and facility personnel that may perform activities in the sealed areas, guidelines and procedures will be developed and implemented for any work being conducted in the respective areas. These guidelines and procedures will detail communications procedures, worker protection requirements, and worker training requirements to be conducted for maintenance or other activities in these areas; and
- Reporting – A report documenting the findings of the visual inspections and monitoring results will be prepared and submitted to EPA.

The details of the MMP will be developed following completion of the remedial activities described above. The results of the verification testing, baseline sampling, and inspections will be used to develop the details of the plan. The MMP will be provided to EPA under a separate submittal following the completion of the remedial activities.



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## **11. SITE RESTORATION AND PROJECT SCHEDULE**

Currently the majority of the building is vacant with the remaining staff and students to be relocated prior to work initiation. The overall project schedule calls for the hazardous materials abatement task to be completed as a first component of the project. In order to meet the overall project schedule, this abatement task, including PCB remediation, is scheduled to initiate in October 2012.

Following completion of the removal activities and verification that the cleanup levels have been met or the risk-based approach applied, the overall building renovation project will continue in accordance with the overall project specifications. The site controls will be dismantled and all wastes will be transported off-site for proper disposal.

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## **12. COMMUNICATION AND DOCUMENTATION**

Prior to initiation and periodically during the work activities, project-related communications with Yale University staff and contractors will be undertaken on an as needed basis. These communications may include schedule and access updates regarding disruption to particular areas or significant project updates. As indicated previously, the building will be vacant during the remediation work.

Following completion of the work activities, records and documents per 40 CFR Part 761 will be generated and maintained in the Yale University Environmental Health and Safety Department files. A final report documenting the completion of the work activities, verification analytical results, volumes of disposed materials, and waste disposal records will be prepared and submitted to EPA.

**Table 2-1**  
**Summary of Sealant Characterization Sampling Results**

**Kline Chemistry Laboratory**  
**Yale University**

Material Type	Material Application	Material Description	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
<b>North Side Main Entryway</b>							
Caulking	Exterior Door Frame to Masonry	1/2" light brown, soft, flexible.	1	Main entryway frame to brick joint	KCL3	1/7/2009	70,500 J
Glazing	Interior Door Frame to Glass	1/8" light gray, soft, not flexible, brittle	1	Main entryway frame to glass joint	KCL-CBK-032	3/29/2012	6,500
<b>Windows</b>							
Glazing	Interior Window Frame to Glass	1/8" gray, medium soft, very flexible	1	Interior window, second floor, Room 233	KCL-CBK-014	3/29/2012	1,900
	Exterior Window Frame to Glass	1/8" white, soft, not flexible, brittle	3	Exterior window, first floor, Room 114	10187 KCL ext	10/18/2010	2,680 J
				Exterior window, first floor, Room 110	10186 KCL ext	10/18/2010	213,000 J
				Exterior window, first floor, Room 146	KCL-CBK-025	3/29/2012	3,060
Caulking	Interior Window Frame to Masonry	1/2" light brown, soft, flexible	4	Interior window, second floor, Room 256	KCL-CBK-001	3/29/2012	400,000
				Interior window, first floor, Room 114	10181 KCL 114 int	10/18/2010	209,000 J
				Interior window, first floor, Room 110	10182 KCL 110 int	10/18/2010	274,000 J
				Interior window, first floor, Room 110	10183 KCL 110 int	10/18/2010	227,000 J
	Exterior Window Frame to Masonry	1/2" light brown, soft, flexible	4	Exterior window, first floor, Room 133	KCL-CBK-018	3/29/2012	390,000
				Exterior window, first floor, Room 110	KCL1	1/7/2009	71,300 J
	Exterior Window Frame to Masonry	1/2" light brown, soft, flexible	4	Exterior window, first floor, Room 114	10184 KCL 114 ext	10/18/2010	294,000 J
				Exterior window, first floor, Room 110	10185 KCL 110 ext	10/18/2010	310,000 J

**Table 2-1**  
**Summary of Sealant Characterization Sampling Results**

**Kline Chemistry Laboratory**  
**Yale University**

Material Type	Material Application	Material Description	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
<b>Ventilation and Heating Systems</b>							
Caulking/Sealant	Interior Metal Duct to Masonry	Red, medium hard, slightly flexible	2	Ductwork in interior of rooftop penthouse	KCL-CBK-012	3/29/2012	67
					KCL-CBK-013	3/29/2012	75
			4	Ductwork in interior of Room 254	KCL-CBK-017	3/29/2012	58.9 J
				Ductwork in interior of Room 254	254-6-12	6/12/2012	203 J
				Ductwork in interior of Room 256	256-6-12	6/12/2012	560 J
				Ductwork in interior of Room 137	137-6-12	6/12/2012	3,000 J
	Interior Metal to Metal Duct	Red, medium hard, slightly flexible	3	Ductwork in east side mechanical room	KCL-CBK-036	6/26/2012	60
					KCL-CBK-037	6/26/2012	61
				Ductwork in west side mechanical room	KCL-CBK-038	6/26/2012	31
	Exterior Rooftop Vent Penetration	1" gray, soft flexible, 1/4" thick	2	Metal to roofing material, roof area near northwest corner of courtyard area elevation	KCL-CBK-007	3/29/2012	< 0.95
				Metal to roofing material, roof area near northeast corner of courtyard area elevation	KCL-CBK-008	3/29/2012	1.4

**Table 2-1**  
**Summary of Sealant Characterization Sampling Results**

**Kline Chemistry Laboratory**  
**Yale University**

Material Type	Material Application	Material Description	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
<b>Interior Control Joints</b>							
Caulking	Basement CMU to CMU Control Joint	1/2" black, soft, flexible	1	CMU to CMU control joint in west side basement hall	KCL-CBK-039	6/26/2012	< 0.87
<b>Rooftop Penthouse</b>							
Caulking	Exterior Door Frame to Masonry	1/2" gray, soft, flexible	1	Door to interior stairwell	KCL-CBK-004	3/29/2012	490,000
	Exterior Masonry to Masonry	1/4" light brown, soft, flexible	1	Brownstone cap on edge of penthouse roof, near northeast corner of northern elevation	KCL-CBK-005	3/29/2012	67
	Exterior Louver Frame to Masonry	1/2" light brown, soft, flexible	1	Louver on northwest corner of penthouse	KCL-CBK-006	3/29/2012	730
<b>Building Cap Joint</b>							
Caulking	Exterior Masonry to Masonry	1/2" reddish brown, soft, flexible	2	Brownstone cap on roof's edge, northeast corner of courtyard area	KCL-CBK-003	3/29/2012	2 J
				Brownstone cap on roof's edge, northwest corner of courtyard area	KCL-CBK-002	3/29/2012	33

**Notes:**

All samples extracted by Soxhlet Method 3540C and analyzed for PCBs by USEPA Method 8082.

All PCBs reported as Aroclor 1248, 1254, and 1260. No other Aroclor reported above the minimum laboratory reporting limit.

J/UJ = Analytical results qualified based on results of external data validation. Additional information included in Appendix B.

**Table 2-2**  
**Summary of Building Material Characterization Sampling Results**

**Kline Chemistry Laboratory**  
**Yale University**

Material Type	Sample Rationale	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
<b>North Side Main Entryway</b>						
Exterior Brick Wall	Delineation of PCB extent	2	4" from east side of main entryway frame to brick joint	KCL-CBB-030	3/29/2012	< 0.43
			4" from west side of main entryway frame to brick joint	KCL-CBB-031	3/29/2012	< 0.48
Exterior Brownstone Ceiling	Delineation of PCB extent	1	6" from main entryway frame to brownstone joint	KCL-CBR-033	3/29/2012	< 0.48
<b>Windows</b>						
Interior CMU Block Wall	Delineation of PCB extent	2	CMU block 1" from frame to CMU joint	1116-1 KCL (Room 110)	10/16/2010	10.5 J
				1116-2 KCL (Room 114)	10/16/2010	13.5 J
		2	CMU block 7" from frame to CMU joint	KCL 2-1-1 (Room 110)	2/1/2011	1.34 J
				KCL 2-1-3 (Room 114)	2/1/2011	1.56 J
		4	CMU block 10" from frame to CMU joint	KCL 2-1-2 (Room 110)	2/1/2011	0.893 J
				KCL 2-1-4 (Room 114)	2/1/2011	0.777 J
				KCL-CBC-015 (Room 233)	3/29/2012	3.8
				KCL-CBC-016 (Room 156)	3/29/2012	2.2
			CMU block immediately past window recess (15 or 18" from frame to CMU joint)	KCL-VBC-048 (Room 156)	6/26/2012	1.46
				KCL-VBC-049 (Room 233)	6/26/2012	4.12
				KCL-VBC-050 (Room 133)	6/26/2012	1.50
				KCL-VBC-051 (Room 243)	6/26/2012	4.42

**Table 2-2**  
**Summary of Building Material Characterization Sampling Results**

**Kline Chemistry Laboratory**  
**Yale University**

Material Type	Sample Rationale	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
Interior CMU Block Wall	Evaluation of PCBs with Depth (0.5 to 1.0")	4	CMU block past the window recess approximately 20 to 27" from frame to CMU joint)	KCL-VBC-202 (Room 243)	7/31/2012	0.38
				KCL-VBC-203 (Room 233)	7/31/2012	0.54
				KCL-VBC-204 (Room 156)	7/31/2012	0.34
				KCL-VBC-207 (Room 133)	7/31/2012	0.68
	Core Characterization Sample	2	Waste Characterization sample of concrete block	KCL-VBC-201	7/31/2012	1.3
				KCL-VBC-205	7/31/2012	0.74 J
	Confirmation of Source Material	8	CMU block in locations without existing known source materials (i.e., no caulking in vicinity of sample)	KCL-CBC-200 (2nd floor hallway)	7/31/2012	0.7
				KCL-CBC-206 (1st floor hallway)	7/31/2012	0.89
				KCL-CBC-208 (1st floor hallway)	7/31/2012	0.71
				KCL-CBC-209 (Basement Hallway)	7/31/2012	0.15
				KCL-CBC-210 (Basement Hallway)	7/31/2012	0.84
				KCL-CBC-211 (Room 19)	7/31/2012	0.36
				KCL-CBC-213 (Basement Hallway)	7/31/2012	0.95 J

**Table 2-2**  
**Summary of Building Material Characterization Sampling Results**

**Kline Chemistry Laboratory**  
**Yale University**

Material Type	Sample Rationale	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
Exterior Brick Wall	Delineation of PCB extent	3	1" from exterior frame to brick window joint	KCL-CBB-022 (Room 154)	3/29/2012	4.1
				KCL-CBB-027 (Room 146)	3/29/2012	2.9
				1117-3 (Room 110)	10/17/2011	0.615 J
		3	3" from exterior frame to brick window joint	KCL-CBB-021 (Room 154)	3/29/2012	0.11 J
				KCL-CBB-026 (Room 146)	3/29/2012	0.22
				1117-4 KCL (Room 110)	10/17/2010	0.045 J
		2	3" from bottom horizontal edge of recessed window on face of the building, courtyard area	KCL-CBB-020 (Room 125)	3/29/2012	0.64
				KCL-VBB-053 (Room 133)	6/26/2012	< 0.091
		2	1/2" from vertical edge of recessed window on face of the building, courtyard area	KCL-CBB-019 (Room 133)	3/29/2012	< 0.48
				KCL-VBB-052 (Room 129)	6/26/2012	< 0.091
Exterior Brownstone Sill	Delineation of PCB extent	4	1" from exterior frame to brownstone window joint	1117-2 KCL (Room 110)	10/17/2010	2.6 J
				KCL-CBR-024 (Room 160)	3/29/2012	8.2
				KCL-CBR-029 (Room 146)	3/29/2012	10
				KCL-CBR-035 (Room 120)	3/29/2012	7.9
		1	3" from exterior frame to brownstone window joint	1117-1 KCL (Room 110)	10/17/2010	0.855 J
		3	10" from exterior frame to brownstone window joint	KCL-CBR-023 (Room 160)	3/29/2012	0.63 J
				KCL-CBR-028 (Room 146)	3/29/2012	0.23
				KCL-CBR-034 (Room 120)	3/29/2012	0.29



Table 2-2  
Summary of Building Material Characterization Sampling Results

Kline Chemistry Laboratory  
Yale University

Material Type	Sample Rationale	Number of Samples	Sample Location	Sample ID	Sample Date	Total PCBs (ppm)
Ventilation and Heating Systems						
Concrete Wall	Pilot Test Removal Areas	3	Concrete Following Removal of Sealant in Room 256	KCL-VBC-042	6/26/2012	4.5
			Concrete Following Removal of Sealant in Room 254	KCL-VBC-043	6/26/2012	1.1
			Concrete Following Removal of Sealant in Room 135	KCL-VBC-047	6/26/2012	0.75
Rooftop Penthouse						
Masonry	Exterior Wall	1	4" from exterior door frame to brick joint, door to interior stairwell	KCL-CBB-011	3/29/2012	< 0.091
		1	4" from louver frame to brick joint	KCL-VBB-040	6/26/2012	< 0.095
	Interior Wall	1	6" below sealant to CMU joint (beginning of second row of block)	KCL-VBB-041	6/26/2012	< 0.087
Penthouse Parapet Cap						
Caulking	Exterior Masonry to Masonry	2	Brownstone cap on roof's edge, northeast corner of courtyard area	KCL-CBK-003	3/29/2012	2 J
			Brownstone cap on roof's edge, northwest corner of courtyard area	KCL-CBK-002	3/29/2012	33

Notes:  
All samples extracted by Soxhlet Method 3540C and analyzed for PCBs by USEPA Method 8082.  
All PCBs reported as Aroclor 1248, 1254, and 1260. No other Aroclor reported above the minimum laboratory reporting limit.  
J/UJ = Analytical results qualified based on results of external data validation. Additional information included in Appendix B.

**Table 3-1  
Summary of Proposed Remedial Approach**

**Kline Chemistry Laboratory  
Yale University**

Planned Project Work Area	Renovation Project Scope	Materials	Characterization Results Summary	Remedial Approach
North Side Main Entry	<b>Scope of Work:</b> Entire North Side Main Entryway curtain wall windows and doors to be removed. Opening to be filled in with brick and windows to match surrounding building.	Caulking (120 l.f.)	Caulking (70,500 ppm PCBs) present on exterior frame to masonry joints and brownstone to brownstone overhang ceiling masonry joints. No interior caulking present.	Caulking, backing material, glazing, frames and components (including glass) removed for disposal as $\geq 50$ ppm PCB Wastes.
		Glazing Sealants	Glazing sealants (6,500 ppm PCBs) present on interior frame to glass joints. No interior glazing sealant observed.	
		Exterior Brick (20 l.f.)	Two samples of exterior brick collected at a distance of 4" from vertical caulked joint (1 sample per joint). Analytical results reported PCBs as non-detect in both samples ( $< 0.43$ and $< 0.48$ ppm).	First half-row of brick (i.e., brick materials in direct contact with caulked joints and to a distance of 4") along vertical joints and the first row of brick above horizontal floor joints to be removed through a cut-line approach for disposal as $\geq 50$ ppm PCB wastes.  Verification samples to be collected at a frequency of 1 sample per 20 l.f. of caulked joint at a distance of 4" from the joint to verify total PCBs $\leq 1$ ppm (No additional samples to be collected).  Brick materials $> 4"$ from the cut-line to be removed as required by the project specifications for off-site disposal as general demolition debris.
		Exterior Brownstone Ceiling (100 l.f.)	One sample of exterior brownstone collected at a distance of 6" from the upper horizontal caulked joint. Analytical results reported PCBs as non-detect ( $< 0.48$ ppm).	Based on number and configuration of caulked joints and total volume of brownstone materials (approximately 1.5 cubic yards), all brownstone materials to be removed for disposal as $\geq 50$ ppm PCB wastes.
Second Floor Curtain Wall Window	<b>Scope of Work:</b> Entire curtain wall windows to be removed. Opening to be filled in with brick and windows to match surrounding building.	Caulking (160 l.f.) <sup>1</sup>	Caulking present on exterior frame to masonry joints and brownstone to brownstone overhang ceiling masonry joints. Exterior caulking assumed to contain $\geq 50$ ppm PCBs based on results from North Side Main Entry caulking. No interior caulking observed.	Caulking, backing material, glazing, window frames and components (including glass) removed for disposal as $\geq 50$ ppm PCB Wastes.
		Glazing Sealants	Glazing sealants (if present) assumed to contain $\geq 50$ ppm PCBs based on results from North Side Main Entry glazing samples. No interior glazing observed.	
		Exterior Brick (40 l.f.)	Results of brick samples collected adjacent to North Side Main Entry door used to characterize extent of PCB impacts $> 1$ ppm for remediation planning (area not currently accessible).	First half-row of brick (i.e., brick materials in direct contact with caulked joints and to a distance of 4") along vertical joints and the first row of brick above horizontal floor joints to be removed through a cut-line approach for disposal as $\geq 50$ ppm PCB wastes.  Verification samples to be collected at a frequency of 1 sample per 20 l.f. of caulked joint at a distance of 4" from the joint along vertical joints (1 sample) and from the second row of brick above floor joints (1 sample) to verify total PCBs $\leq 1$ ppm.  Brick materials beyond the cut-line to be removed as required by the project specifications for off-site disposal as general demolition debris.
		Exterior Brownstone Ceiling (100 l.f.)	Results of brownstone samples collected adjacent to North Side Main Entry door used to characterize extent of PCB impacts $> 1$ ppm for remediation planning (area not currently accessible).	Based on number and configuration of caulked joints and total volume of brownstone materials (approximately 1.5 cubic yards), all brownstone materials to be removed for disposal as $\geq 50$ ppm PCB wastes.
		Exterior Terrazzo Flooring (40 l.f.)	Caulking assumed to contain $\geq 50$ ppm PCBs based on caulking surrounding North Side Main Entry door. No characterization data available due to area not currently accessible.	Terrazzo flooring in direct contact with caulked joint and to a distance of 8" from the caulked joint to be removed through a cut-line approach for disposal as $\geq 50$ ppm PCB wastes.  Verification samples to be collected at a frequency of 1 sample per 20 l.f. of caulked joint at a distance of 8" from the caulked joints to verify total PCBs $\leq 1$ ppm (2 samples).  Terrazzo flooring beyond the cut-line to be removed as required by the project specification for off-site disposal as general demolition debris.

Note (1) Linear footage of caulking does not include 20 l.f. of a common joint between the brick walls and terrazzo flooring included in the linear footages below.

**Table 3-1**  
**Summary of Proposed Remedial Approach**  
**Kline Chemistry Laboratory**  
**Yale University**

Planned Project Work Area	Renovation Project Scope	Materials	Characterization Results Summary	Conceptual Remedial Approach
Interior Portions of Windows (84 windows)	<b>Scope of Work:</b> Windows to be removed and replaced. Interior building materials adjacent to the windows to be completely removed as part of interior renovations.	Caulking (1,512 l.f.)	Caulking present on interior vertical window frame to masonry joints (approximately 18 l.f. per window) with reported PCB concentrations ranging from 209,000 to 400,000 ppm.	Caulking, backing material, glazing sealant, window frames and components (including glass) removed for disposal as ≥ 50 ppm PCB Waste to a hazardous waste disposal facility.
		Glazing Sealants	Glazing sealants present on interior frame to glass joints with a reported PCB concentration of 1,900 ppm.	
		Interior CMU Block Walls (1,512 l.f.)	Samples of CMU block were collected at distances up to 18 inches from caulked joints. Analytical results indicated that PCBs were reported in samples at concentrations ranging from 0.777 to 14 ppm.  Based on analytical results, additional samples of CMU block were collected at areas away from identified source materials (i.e., caulking). Analytical results indicated that PCBs were < 1 ppm.	CMU block materials to be segregated for disposal as follows: <ul style="list-style-type: none"> <li>First row of CMU block materials (i.e., the row in direct contact with caulked joints) to be removed and segregated for disposal as ≥ 50 ppm PCB wastes at a hazardous waste disposal facility;</li> <li>CMU block materials beyond the first row and to a point beyond the presence of additional source materials (see Section 6 for discussion) to be removed through cut-line approach for disposal as &lt; 50 ppm PCB wastes to a non-hazardous waste disposal landfill.</li> </ul> Verification samples collected immediately beyond the extent of proposed removal to confirm total PCBs ≤ 1 ppm.  CMU block materials beyond the cut-line to be removed for off-site disposal as general demolition debris.
Exterior Portions of Windows (84 windows)	<b>Scope of Work:</b> Windows to be removed and replaced. Exterior brick and brownstone to remain in place except in south courtyard within limits of proposed curtain wall window system, where the entire façade is to be removed in this area.	Caulking (2,100 l.f.)	Caulking present on all exterior frame to masonry joints (approximately 25 l.f. per window) with reported PCB concentrations ranging from 71,300 to 390,000 ppm.	Caulking, backing material, glazing sealants, window frames and components (including glass) removed for disposal as ≥ 50 ppm PCB Waste to a hazardous waste disposal facility.
		Glazing Sealants	Glazing sealants present on exterior frame to glass joints with reported PCB concentrations of 2,680, 3,060, and 213,000 ppm.	

Table 3-1  
Summary of Proposed Remedial Approach

Kline Chemistry Laboratory  
Yale University

Planned Project Work Area	Renovation Project Scope	Materials	Characterization Results Summary	Conceptual Remedial Approach
Exterior Portions of Windows (con't)	<b>Scope of Work (con't):</b> Windows to be removed and replaced. Exterior brick and brownstone to remain in place except in south courtyard within limits of proposed curtain wall window system, where the entire façade is to be removed in this area.	Brick – To be Removed (36 windows)	<p>Brick materials are present along the vertical and horizontal frame to masonry joints of 36 of the courtyard area windows to be removed (approximately 25 l.f. per window)</p> <p>Samples of brick collected at a distance of 1/2" from the vertical edge of the window recess and at a distance of 3" below the lower horizontal edge of the window recess (i.e., all samples collected outside the window recess on the face of the building). Analytical results indicated that PCBs were non-detect (&lt; 0.48 and &lt; 0.091 ppm) along the vertical joints and non-detect (&lt; 0.091 ppm) and present at a concentration of 0.64 ppm along the horizontal joints.</p>	<p>Brick materials surrounding windows in the southern courtyard area (36 windows) to be removed for off-site disposal for installation of new curtain wall system.</p> <p>Brick materials in direct contact with caulked joints, within the window recess, and to a distance of 6" from the caulked joints (first row of horizontal bricks above and below the windows) and a distance of 4" away from vertical joints (i.e., first half-row of brick away from the recess) to be removed through a cut-line approach for disposal as ≥ 50 ppm PCB wastes to a hazardous waste disposal facility.</p> <p>Verification samples to be collected at a sample frequency of 1 sample per 50 l.f. to verify total PCBs &lt; 1 ppm (18 samples).</p> <p>Verification samples will be evenly divided between materials below the recess and materials adjacent to the vertical joints. Along each joint, the specific location of each sample will be selected using a random number generator based on the total length of the caulked joint. Samples to be collected as follows:</p> <ul style="list-style-type: none"><li>• Away from Vertical Joints – samples to be collected immediately past the first half-row of brick outside the window recess; and</li><li>• Below Lower Horizontal Joints – samples to be collected from the beginning of the second row of brick below the window recess (no samples proposed to be collected above the windows based on assumed worse-case migration of PCBs to materials below the windows).</li></ul> <p>Brick materials beyond the cut-line (i.e., ≤ 1 ppm) to be removed for off-site disposal as general demolition debris.</p>
		Brick – To remain in Place (48 windows)	<p>Brick materials are present along the vertical frame to masonry joints of the windows (approximately 19 l.f. per window).</p> <p>Samples of brick collected at distances of 1" and 3" from the caulked joint. Reported PCB concentrations of 0.615, 2.9, and 4.1 ppm at a distance of 1" from the caulked joint and &lt; 1 ppm (0.045, 0.11, and 0.22 ppm) at a distance of 3" from the caulked joint.</p>	<p>High Occupancy Clean Up Standard of 1 ppm to be applied to first floor locations (24 windows). Low Occupancy Clean Up Standard of 25 ppm to be applied to all second floor locations (24 windows).</p> <p>Pre-application delineation bulk sampling to be conducted at a sample frequency of 1 sample per 100 l.f. of caulking next to brick to determine the extent of the coating/sealant application (10 samples).</p> <p>Following caulking and window removal, liquid coating/sealant to be applied to materials as follows (based on pre-application sampling):</p> <ul style="list-style-type: none"><li>• All Locations – Brick materials formerly in direct contact with PCB-containing caulking and away from the caulking that will be covered by the replacement window frames to be encapsulated with two coats of Sikagard 62 epoxy;</li><li>• High Occupancy Locations – Brick materials away from the caulked joint beyond the extent of the replacement window frames and to the end of the window recess (approximately 4") to be encapsulated with two coats of a liquid coating/sealant (to be selected by the project team).</li><li>• Low Occupancy Locations – None assumed at this time; to be confirmed by additional samples.</li></ul> <p>Following application of liquid coating/sealant, verification wipe samples to be collected from encapsulated brick materials both formerly in direct contact with and away from the caulked joints at a sample frequency of 1 sample per 100 l.f. Wipe samples to be collected from epoxy coated materials (10 samples) and from clear coated materials (5 samples).</p> <p>Results of verification sampling to be compared to encapsulation standard as follows:</p> <ul style="list-style-type: none"><li>• ≥ 1 µg/100cm<sup>2</sup> – Additional liquid coating/sealant may be applied, verification samples recollected;</li><li>• &lt; 1 µg/100cm<sup>2</sup> – No Further Action</li></ul>
		Brownstone Sills (48 windows)	<p>Brownstone materials are present along upper and lower horizontal frame to masonry joints (approximately 5.5 l.f. per window).</p> <p>Samples of brownstone collected at distances of 1", 3", and 10" from the caulked joint. Reported PCB concentrations as follows:</p> <ul style="list-style-type: none"><li>• 1" (4 samples) – total PCB concentrations of 2.6, 7.9, 8.2, and 10 ppm;</li><li>• 3" (1 sample) – total PCB concentration of 0.855 ppm; and</li><li>• 10" (3 samples) – total PCB concentrations of 0.23, 0.29, and 0.63 ppm.</li></ul>	<p>High Occupancy Clean Up Standard of 1 ppm to be applied to first floor locations (24 windows). Low Occupancy Clean Up Standard of 25 ppm to be applied to all other locations (24 windows).</p> <p>Pre-application delineation bulk sampling to be conducted at a sample frequency of 1 sample per 50 l.f. of caulking next to brownstone to determine the extent of coating/sealant application (6 samples).</p> <p>Following caulking and window removal, liquid coating/sealant to be applied to materials as follows:</p> <ul style="list-style-type: none"><li>• All Locations - Brownstone materials formerly in direct contact with PCB-containing caulking and materials away from the caulking that will be covered by the replacement window frames to be encapsulated with two coats of Sikagard 62 epoxy;</li><li>• High Occupancy Areas - Brownstone materials across the entire upper horizontal face of the window sill and lower horizontal face</li></ul>

**Table 3-1  
Summary of Proposed Remedial Approach**

**Kline Chemistry Laboratory  
Yale University**

Planned Project Work Area	Renovation Project Scope	Materials	Characterization Results Summary	Conceptual Remedial Approach
Exterior Portions of Windows (con't)	<b>Scope of Work (con't):</b> Windows to be removed and replaced. Exterior brick and brownstone to remain in place except in south courtyard within limits of proposed curtain wall window system, where the entire façade is to be removed in this area.	Brownstone Sills (48 windows) (cont'd)		<ul style="list-style-type: none"> <li>of the window header beyond the extent of the replacement window frames to be encapsulated with two coats of a liquid coating/sealant (to be selected by the project team).</li> <li>Low Occupancy Locations – None assumed at this time; to be confirmed by additional samples.</li> </ul> <p>Following application of liquid coating/sealant, verification wipe samples to be collected from encapsulated brownstone materials both formerly in direct contact with and away from the caulked joints at a sample frequency of 1 sample per 50 l.f. Wipe samples to be collected from epoxy coated materials (6 samples) and from clear coated materials (3 samples). Results of verification sampling to be compared to encapsulation standard as follows:</p> <ul style="list-style-type: none"> <li>≥ 1 µg/100cm<sup>2</sup> - Additional liquid coating/sealant may be applied, verification samples recollected;</li> <li>&lt; 1 µg/100cm<sup>2</sup> - No Further Action.</li> </ul>
Roof Top Doors (3 doors) and Ventilation Louvers (16 Louvers)	<b>Scope of Work:</b> Penthouse doors and ventilation louvers to be removed as part of roof top penthouse demolition and removal.	Caulking (50 l.f. - doors) (144 l.f. – louvers)	Caulking present on exterior frame to brick joints on all three doors and 16 louvers (approximately 9 l.f. per louver). Door caulking with a reported PCB concentration of 490,000 ppm and ventilation louver caulking with a reported PCB concentration of 730 ppm.	Caulking, backing material, and door and louver frames and components removed for disposal as ≥ 50 ppm PCB Wastes to a hazardous waste disposal facility.
		Brick	Two samples of brick collected at a distance of 4" from the caulked joint (beginning of second full row of brick, immediately past first half-row of brick). PCBs reported as non-detect (≤ 0.091 and < 0.095 ppm).	<p>Brick materials in direct contact with caulked joints and to a distance of 4" from the vertical caulked joints and the first row of bricks above and below the horizontal joints to be removed through a cut-line approach for disposal as ≥ 50 ppm PCB wastes to a hazardous waste disposal facility.</p> <p>Verification samples to be collected at a frequency of 1 sample per door (3 samples) and 1 sample per 4 louvers (4 samples) to be collected 4" from the joint to verify total PCBs ≤ 1 ppm.</p> <p>Brick materials beyond the cut-line to be removed as required by the project specifications for off-site disposal as general demolition debris.</p>
		Metal Flashing	No samples collected to date.	<p>Metal flashing in direct contact (i.e., at the base of each vertical frame to brick joint) and to a minimum distance of 6" from the caulked joint to be removed for disposal as ≥ 50 ppm PCB Wastes to a hazardous waste disposal facility.</p> <p>Wipe samples to be collected at a distance of 6" from the base of the vertical joint for every 4<sup>th</sup> louver (total of 4 samples) to verify PCBs ≤ 10 µg/100cm<sup>2</sup>. Results of verification sampling to be compared to non-porous decontamination standard as follows:</p> <ul style="list-style-type: none"> <li>&gt; 10 µg/100cm<sup>2</sup> – Additional flashing to be removed, verification samples recollected at a further distance from the joint.</li> <li>≤ 10 µg/100cm<sup>2</sup> - No Further Action</li> </ul>
Penthouse Parapet Cap	<b>Scope of Work:</b> Penthouse parapet cap to be removed as part of roof top penthouse demolition and removal.	Caulking (265 l.f.)	Caulking present on brownstone cap to metal flashing joints along the top of penthouse cap (220 l.f.) and on brownstone to brownstone cap joints oriented laterally across the penthouse cap (55, 10-inch joints located every 4 feet along the cap). One sample of penthouse cap joint caulking collected with a reported PCB concentration of 67 ppm.	Caulking, backing material, and metal flashing removed for disposal as ≥ 50 ppm PCB Wastes to a hazardous waste disposal facility.

**Table 3-1  
Summary of Proposed Remedial Approach**

**Kline Chemistry Laboratory  
Yale University**

Planned Project Work Area	Renovation Project Scope	Materials	Characterization Results Summary	Conceptual Remedial Approach
Penthouse Parapet Cap (con't)	<b>Scope of Work: (con't.)</b> Penthouse parapet cap to be removed as part of roof top penthouse demolition and removal.	Brownstone Cap	Samples of cap materials not collected. Assume impacts to brownstone cap based on results of brownstone sill samples.	All brownstone cap materials removed for off-site disposal as $\geq 50$ ppm PCB wastes to a hazardous waste disposal facility.
		Brick	Samples of brick not collected.	Brick in direct contact with lateral joints (immediately below the joint) to be removed for off-site disposal as $\geq 50$ ppm PCB waste to a hazardous waste disposal facility.  Verification samples to be collected at a frequency of 1 sample per 10 joints at the beginning of the second row of brick below the joint to verify total PCBs $\leq 1$ ppm (total of 6 samples).  Remaining brick materials to be removed as required by the project specifications for off-site disposal as general demolition debris.
Ductwork	<b>Scope of Work:</b> Ductwork to be removed as part of roof top penthouse demolition.	Ductwork Sealant	Ductwork sealant identified on metal to metal and metal to masonry joints in the penthouse mechanical rooms and on metal to masonry joints in select areas of the building, reported PCB concentrations ranging from of 58.9 to 3,000 ppm.	Ductwork sealant removed for off-site disposal as $\geq 50$ ppm PCB wastes to a hazardous waste disposal facility.
		Metal Ductwork	Three wipe samples collected from metal ductwork within the variable flow control boxes immediately past the sealant. PCBs reported as non-detect (2 samples at $< 0.20 \mu\text{g}/100\text{cm}^2$ ) and at a concentration of $0.34 \mu\text{g}/100\text{cm}^2$ .	Ductwork to be removed through waste segregation approach as described in Section 8.3 for disposal as either $\geq 50$ ppm PCB wastes or general demolition debris.  Verification wipe samples to be collected to confirm waste segregation approach per specific location. Results of verification wipe samples to be compared to the high occupancy non-porous clean up standard as follows: <ul style="list-style-type: none"> <li><math>&gt; 10 \mu\text{g}/100\text{cm}^2</math> – Additional samples collected to determine extent of PCBs <math>&gt; 10 \mu\text{g}/100\text{cm}^2</math>. Cut-line modified based on results; and</li> <li><math>\leq 10 \mu\text{g}/100\text{cm}^2</math> –No further action.</li> </ul> Remaining ductwork materials to be removed for disposal as required by the project specifications as general demolition debris.
		Concrete	No samples collected.	Removal of concrete materials in direct contact with sealant to a depth of $\frac{1}{4}$ " through physical methods (e.g. chipping). Removed concrete materials to be disposed of as $\geq 50$ ppm PCB wastes to a hazardous waste disposal facility.  Following removal, verification samples of underlying concrete to be collected at a frequency of 1 sample per 10 penetrations.  Results of verification sampling to be compared to the high occupancy use clean up criteria as follows: <ul style="list-style-type: none"> <li><math>&gt; 1</math> ppm – Concrete formerly in direct contact with sealant to be encapsulated with two coats of liquid epoxy coating, follow-up verification wipe samples to be collected at the same sample frequency; and</li> <li><math>\leq 1</math> ppm – No further action.</li> </ul>
		CMU Block Walls	One sample collected at a distance of 6" from the sealant. Total PCBs reported as non-detect ( $< 0.087$ ppm).	CMU block materials formerly in direct contact with and to a distance of 6" from the sealant to be removed for disposal as $\geq 50$ ppm PCB wastes to a hazardous waste disposal facility.  Verification samples to be collected at a frequency of 1 sample per 10 penetrations to verify waste segregation. Sample location selected using a random number generator based on the total perimeter of the ductwork at the selected penetration with the lower left hand corner representing zero and progressing clockwise around the ductwork.  CMU block materials beyond the cut-line to be removed for disposal as general demolition debris.

**Table 3-2  
Verification Sampling Summary**

**Kline Chemistry Laboratory  
Yale University**

Materials	Associated Joint	Verification Sampling Plan	Verification Sample Frequency	Number of Samples	Notes
<b>North Side Main Entryway</b>					
Brick	Vertical Frame to Brick Joints (20 l.f.)	Samples collected at a distance of 4" from the joint (i.e., immediately past the first half-row of brick).	1 sample per 20 l.f.	2	Samples collected previously. No additional samples to be collected
<b>North Side Second Floor Curtain Wall Window</b>					
Brick	Vertical Frame to Brick Joints (20 l.f.)	Samples collected at a distance of 4" from the joint (i.e., immediately past the first half-row of brick).	1 sample per 20 l.f.	1	
	Horizontal Brick to Terrazzo Floor Joints (20 l.f.)	Samples collected from the beginning of the second row of horizontal brick above the caulked joints.	1 sample per 20 l.f.	1	
Terrazzo Floor	Horizontal Frame to Terrazzo Flooring (20 l.f.)	Samples to be collected at a distance of 8" from the caulked joint.	1 sample per 20 l.f.	1	
	Horizontal Brick to Terrazzo Floor Joints (20 l.f.)	Samples to be collected at a distance of 8" from the caulked joints.	1 sample per 20 l.f.	1	
<b>Windows</b>					
Interior CMU Block	Interior Vertical Frame to CMU Block	Samples to be collected from materials beyond the extent of additional source materials, typically at a clean "break point" such as 90-degree wall angle or door opening.	1 sample per 50 l.f.	9	Approximate wall height of 9 ft. at each of the 46 identified "break-points"
Exterior Brick To Be Removed	Frame to Brick Joints (36 windows)	Samples to be collected immediately past the first half-row of brick along vertical joints and from the second row of brick below the lower horizontal joints.	1 sample per 50 l.f.	18	Approximately 25 l.f. of caulking per window; 4 of the 18 samples collected previously
Exterior Brick To Remain In Place	High Occupancy Area Frame to Brick Joints (24 windows)	Samples to be collected at end of window recess.	1 sample per 100 l.f.	5	Approximately 19 l.f. of caulking next to brick per window; 3 of the 5 samples collected previously
	Low Occupancy Area Frame to Brick Joints (24 Windows)	Samples to be collected at a distance of 1" from the former caulked joint.	1 sample per 100 l.f.	5	Approximately 19 l.f. of caulking next to brick per window
Brownstone	High Occupancy Area Frame to Brownstone Joints (24 windows)	Samples to be collected at a distance of 10" from the caulked joints.	1 sample per 50 l.f.	3	Approximately 6 l.f. of caulking next to brownstone per window; Samples collected previously
	Low Occupancy Area Frame to Brownstone Joints (24 windows)	Samples to be collected at a distance of 1" from the caulked joints.	1 sample per 50 l.f.	3	Approximately 6 l.f. of caulking next to brownstone per window

**Table 3-2  
Verification Sampling Summary**

**Kline Chemistry Laboratory  
Yale University**

Materials	Associated Joint	Verification Sampling Plan	Verification Sample Frequency	Number of Samples	Notes
Verification Wipe Samples	Exterior Brick Formerly in Direct Contact	Verification wipe samples to be collected from epoxy coated brick.	1 sample per 100 l.f.	10	
	Exterior Brick Away from the Joint (High Occupancy Areas)	Verification wipe samples to be collected from clear-coated brick materials.	1 sample per 100 l.f.	5	
	Exterior Brownstone Formerly in Direct Contact	Verification wipe samples to be collected from epoxy coated brownstone.	1 sample per 50 l.f.	6	
	Exterior Brownstone Away from the Joint (High Occupancy Areas)	Verification wipe samples to be collected from clear-coated brownstone materials.	1 sample per 50 l.f.	3	
<b>Rooftop Penthouse</b>					
Brick	Door Frame to Brick Joints (3 doors; 50 l.f.)	Samples to be collected immediately past the first half-row of bricks away from vertical caulked joint (i.e., approximately 4" from the caulked joint).	1 sample per door.	3	1 of the 3 samples collected previously
	Louver Frame to Brick Joints (16 louvers; 144 l.f.)	Samples to be collected immediately past the first half-row of brick along vertical joints (i.e., approximately 4" from the caulked joint).	1 sample per 50 l.f.	3	1 of the 3 samples collected previously
	Parapet Brownstone to Brownstone Lateral Joints	Samples to be collected at the beginning of the second row of brick immediately below the joint.	1 sample per 10 joints	6	
Metal Flashing	Louver Frame to Metal Flashing (16 louvers)	Wipe samples to be collected at a distance of 6" from the base of the vertical joint.	1 sample per 50 l.f.	3	
<b>Ventilation System Components and Ductwork</b>					
Concrete	Metal to Concrete Joints	Verification samples to be collected from materials formerly in direct contact with the sealant following sealant and concrete removal to a depth of 1/4".	1 sample per 10 wall penetrations.	10	92 wall penetrations
CMU Block	Metal to CMU Joints in Penthouses	Verification samples to be collected at a distance of 6" from the red sealant.	1 sample per 10 wall penetrations.	4	36 wall penetrations; 1 of the 4 samples collected previously.
Metal Ductwork	Metal to Metal and Metal to Concrete Joints - Interior Overhead Spaces	Verification wipe sample to be collected from junction boxes.	1 sample to be collected per 5 junction boxes.	10	46 mixing junction boxes; 3 of the 10 samples collected previously.
	Metal to Metal Joints - Basement Mechanical Spaces	Verification wipe samples to be collected at a distance of 6" from the joints (i.e., immediately past the selected cut-line).	1 sample per 100 l.f. of joint.	T.B.D.	

Notes:

L.F. = Linear Feet

T.B.D. = To Be Determined All samples extracted by Soxhlet Method 3540C and analyzed for PCBs by USEPA Method 8082.



**Table 8-1**  
**Summary of Pilot Test Wipe Sample Results**

**Kline Chemistry Laboratory**  
**Yale University**

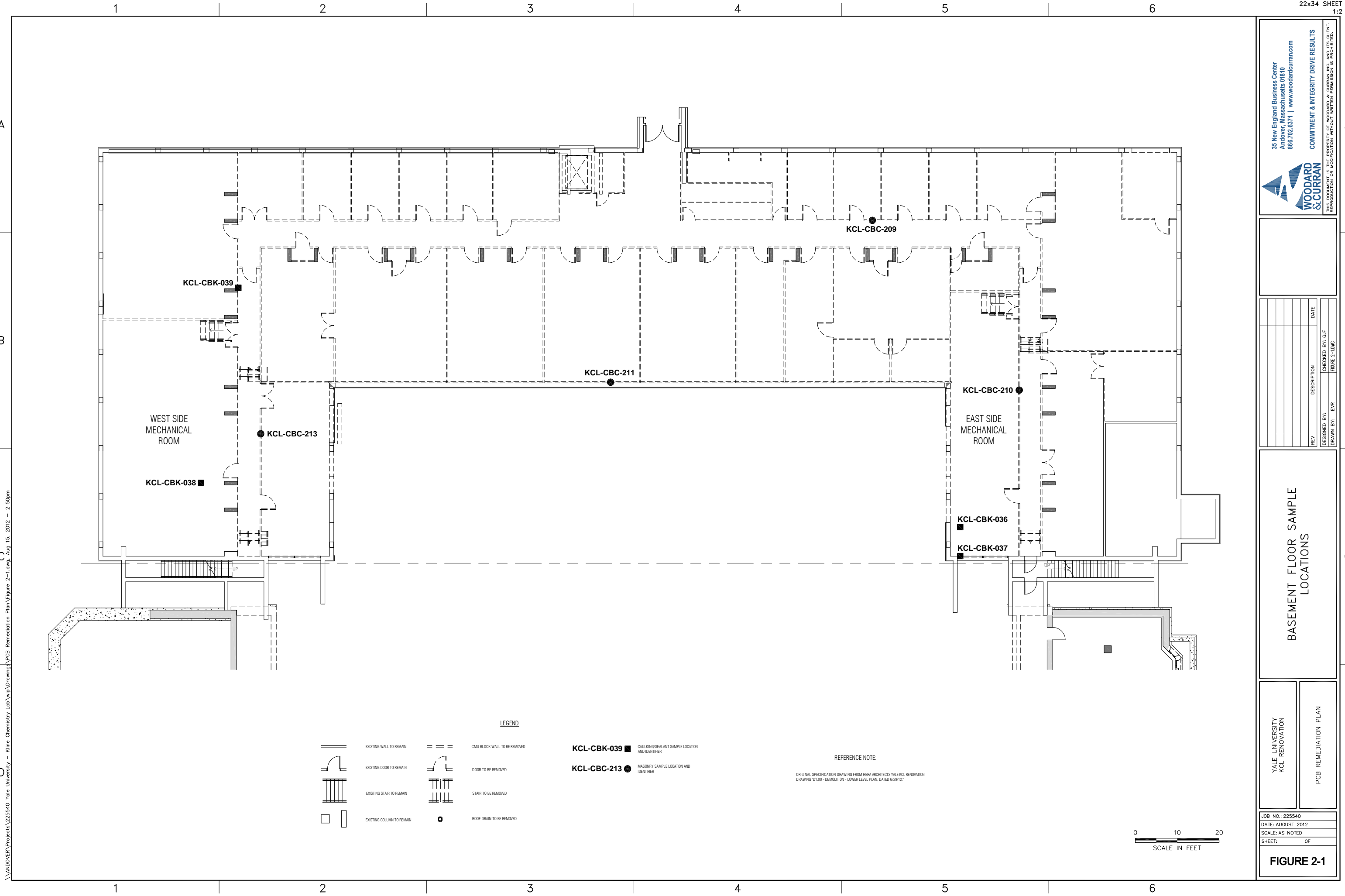
<b>Pilot Test Area</b>	<b>Verification Concrete Sample ID</b>	<b>Total PCBs (ppm)</b>	<b>Verification Wipe Sample ID</b>	<b>Total PCBs (µg/100cm<sup>2</sup>)</b>
Room 135	KCL-VBC-047	0.75	KCL-VWP-046	< 0.20
Room 254	KCL-VBC-043	1.1	KCL-VWP-044	0.34
Room 256	KCL-VBC-042	6.5	KCL-VWP-045	< 0.20

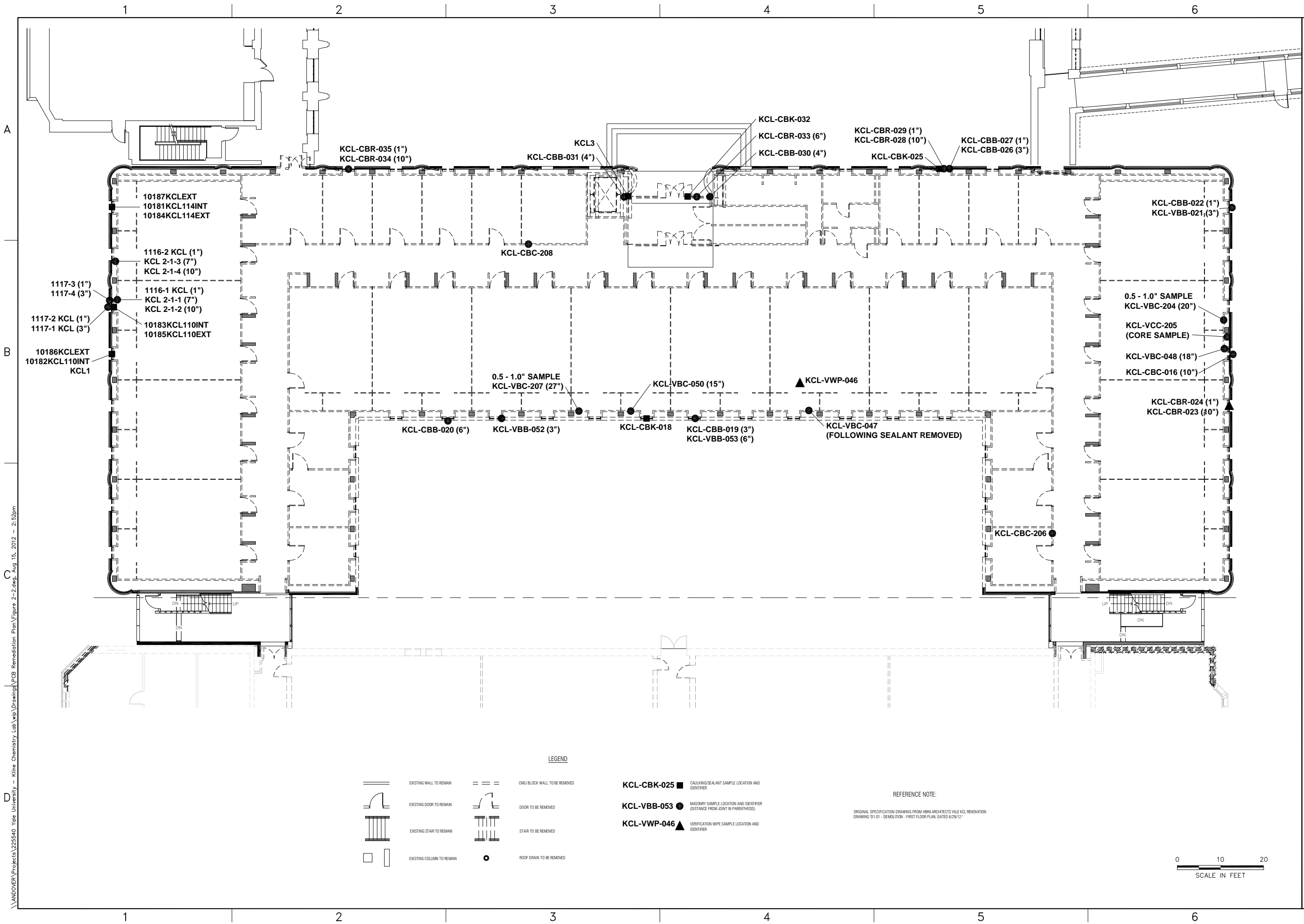
Notes:

Verification concrete samples collected following removal of all visible sealant from structural concrete materials. Samples collected from 0 to 0.5 inches.


Verification wipe samples collected from metal materials within the duct immediately past the last location where sealant was observed.

All samples extracted by Soxhlet Method 3540C and analyzed for PCBs by USEPA Method 8082.





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REV	DESCRIPTION	DATE

DESIGNED BY: GJF  
DRAWN BY: EVR

CHECKED BY: GJF  
FIGURE 2-2DWG

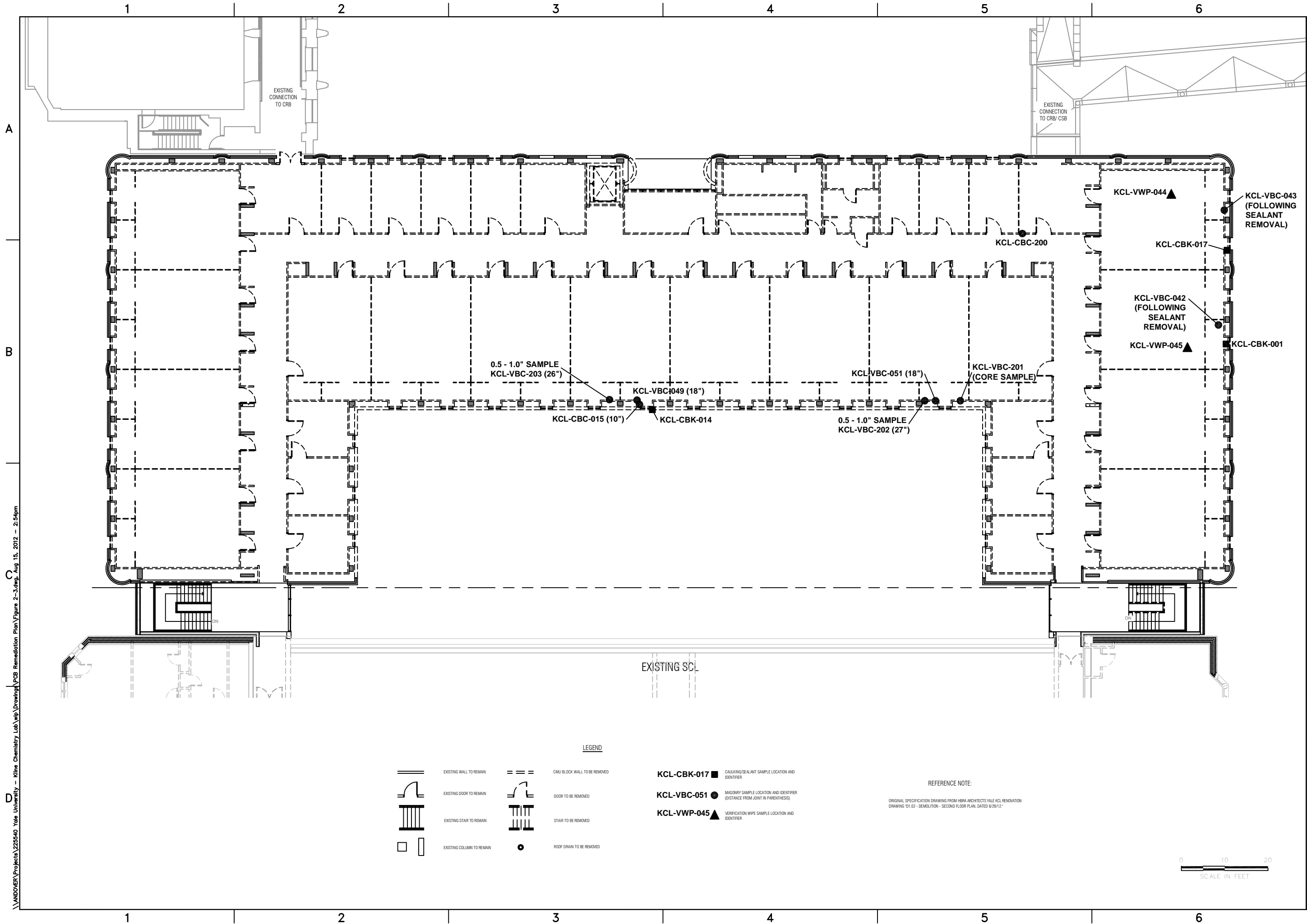
FIRST FLOOR  
SAMPLE LOCATIONS


YALE UNIVERSITY KCL  
RENOVATION

PCB REMEDIATION PLAN

JOB NO.: 225540  
DATE: AUGUST 2012  
SCALE: AS NOTED  
SHEET: 0F

**FIGURE 2-2**



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[illegible]

## SECOND FLOOR SAMPLE LOCATIONS

YALE UNIVERSITY KCL  
RENOVATION

PCB REMEDIATION PLAN

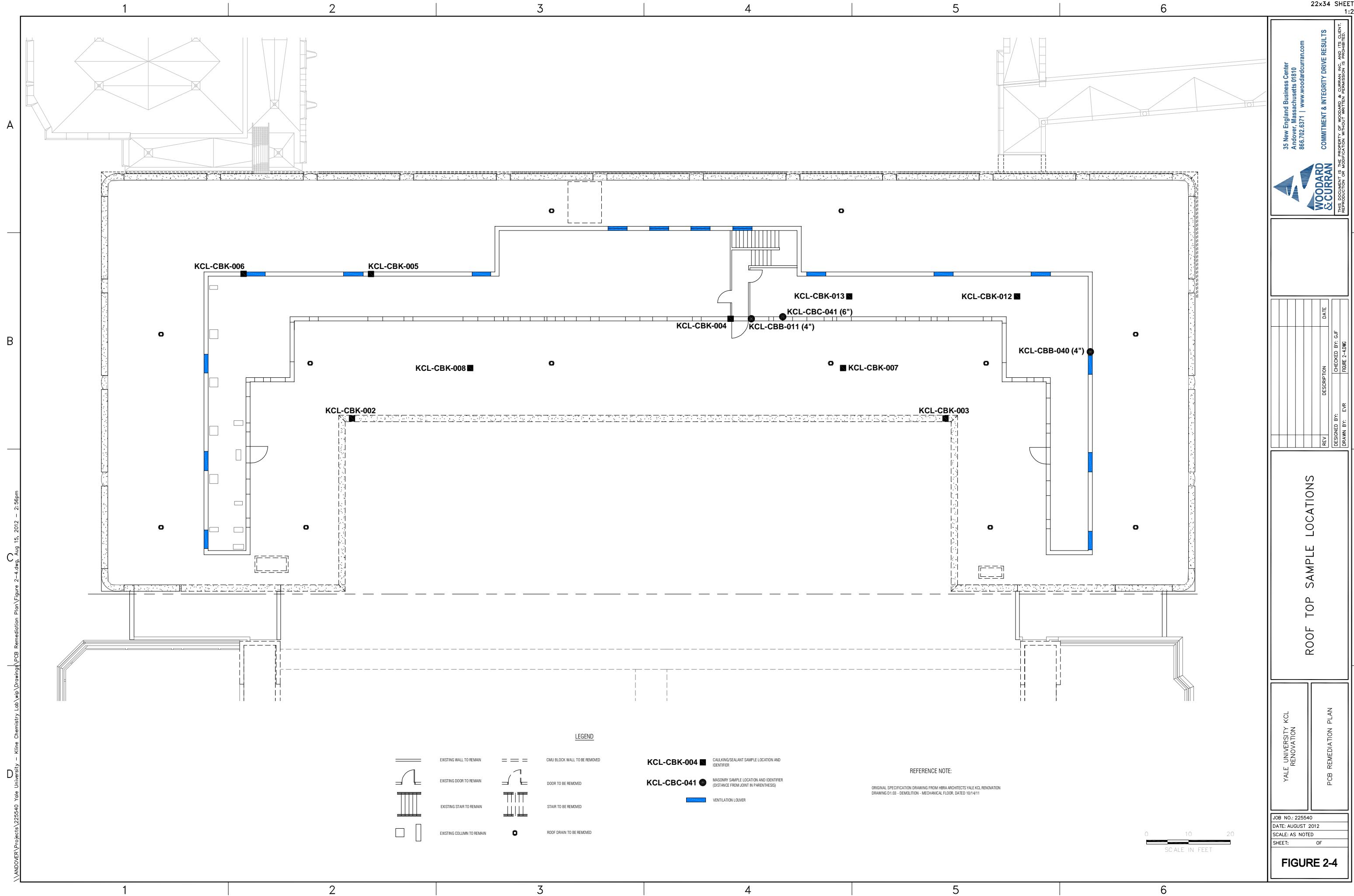
**JOB NO.: 225540**

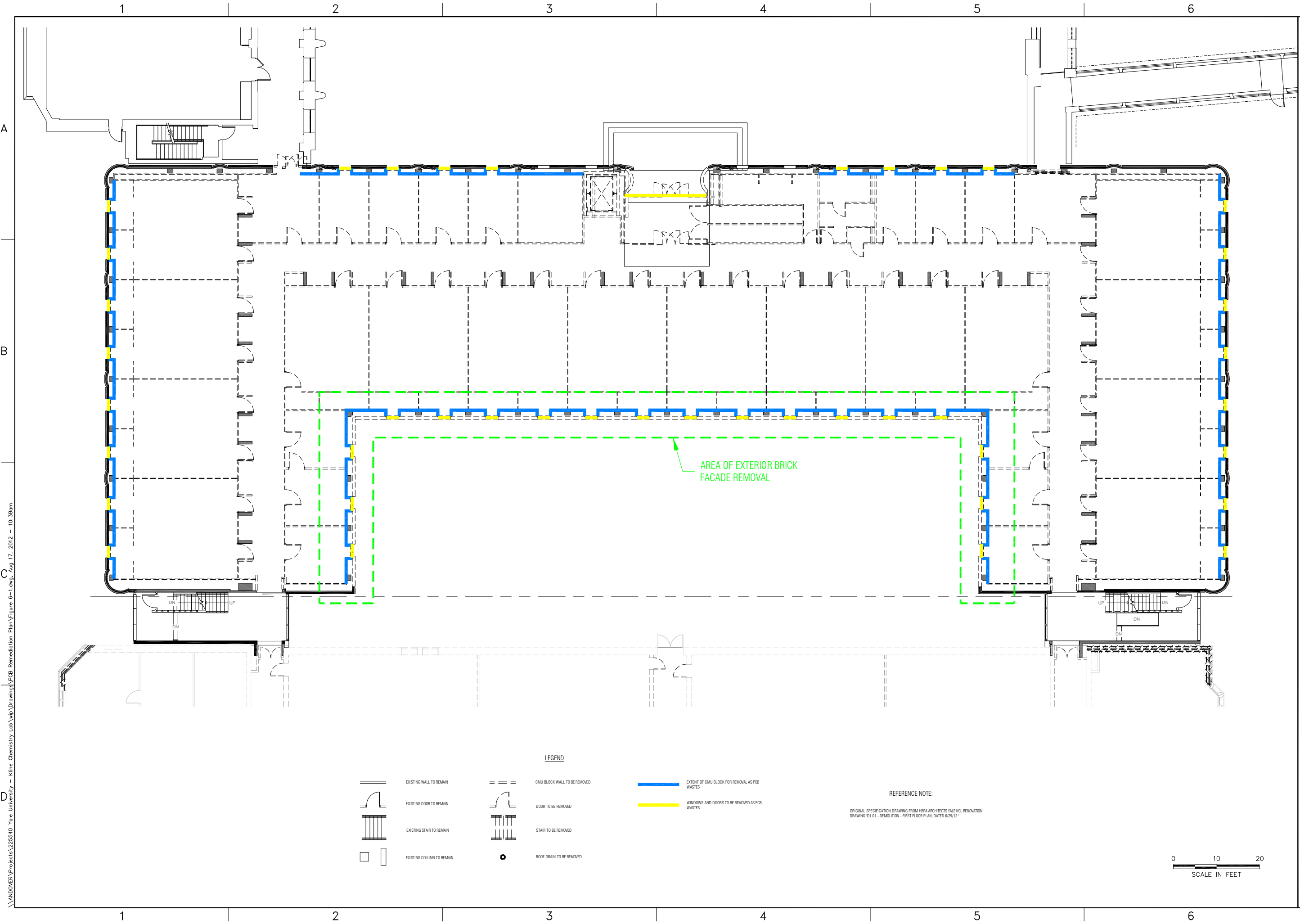
DATE: AUGUST 2012

SCALE: AS NOTED

SHEET: OF


FIGURE 2-3





\\ANDOVER\Projects\225540 Yale University - Kline Chemistry Lab\wp\Drawing\PCB Remediation Plan\Figure 6-1.dwg, Aug 17, 2012 - 10:38am

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REV	DESCRIPTION	DATE

DESIGNED BY: GJF	CHECKED BY: GJF
DRAWN BY: EVR <td>FIGURE 6-1.DWG</td>	FIGURE 6-1.DWG

YALE UNIVERSITY KCL  
RENOVATION

PCB REMEDIATION PLAN

JOB NO.: 225540

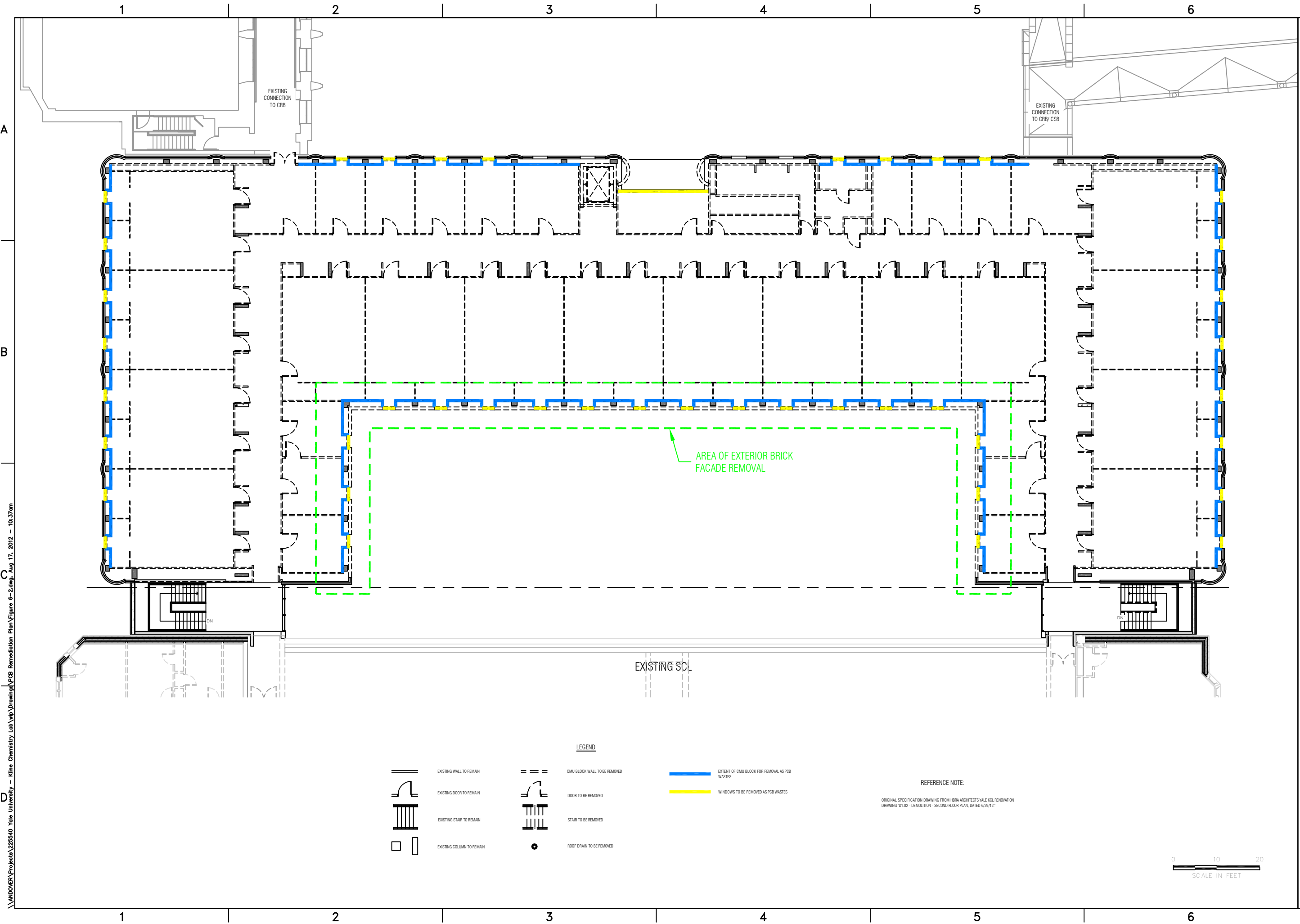
DATE: AUGUST 2012

SCALE: AS NOTED

SHEET: 0F


**FIGURE 6-1**

PCB REMOVAL AREAS  
FIRST FLOOR



\\ANDOVER\Projects\225540 Yale University - Kline Chemistry Lab\wp\Drawings\PCB Remediation Plan\Figure 6-2.dwg, Aug 17, 2012 -- 10:37am

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REV	DESCRIPTION	DATE

DESIGNED BY: GJF  
DRAWN BY: EVR

CHECKED BY: GJF  
FIGURE 6-2.DWG

YALE UNIVERSITY KCL  
RENOVATION

PCB REMEDIATION PLAN

JOB NO.: 225540

DATE: AUGUST 2012



SCALE: AS NOTED

SHEET: 0F

**FIGURE 6-2**

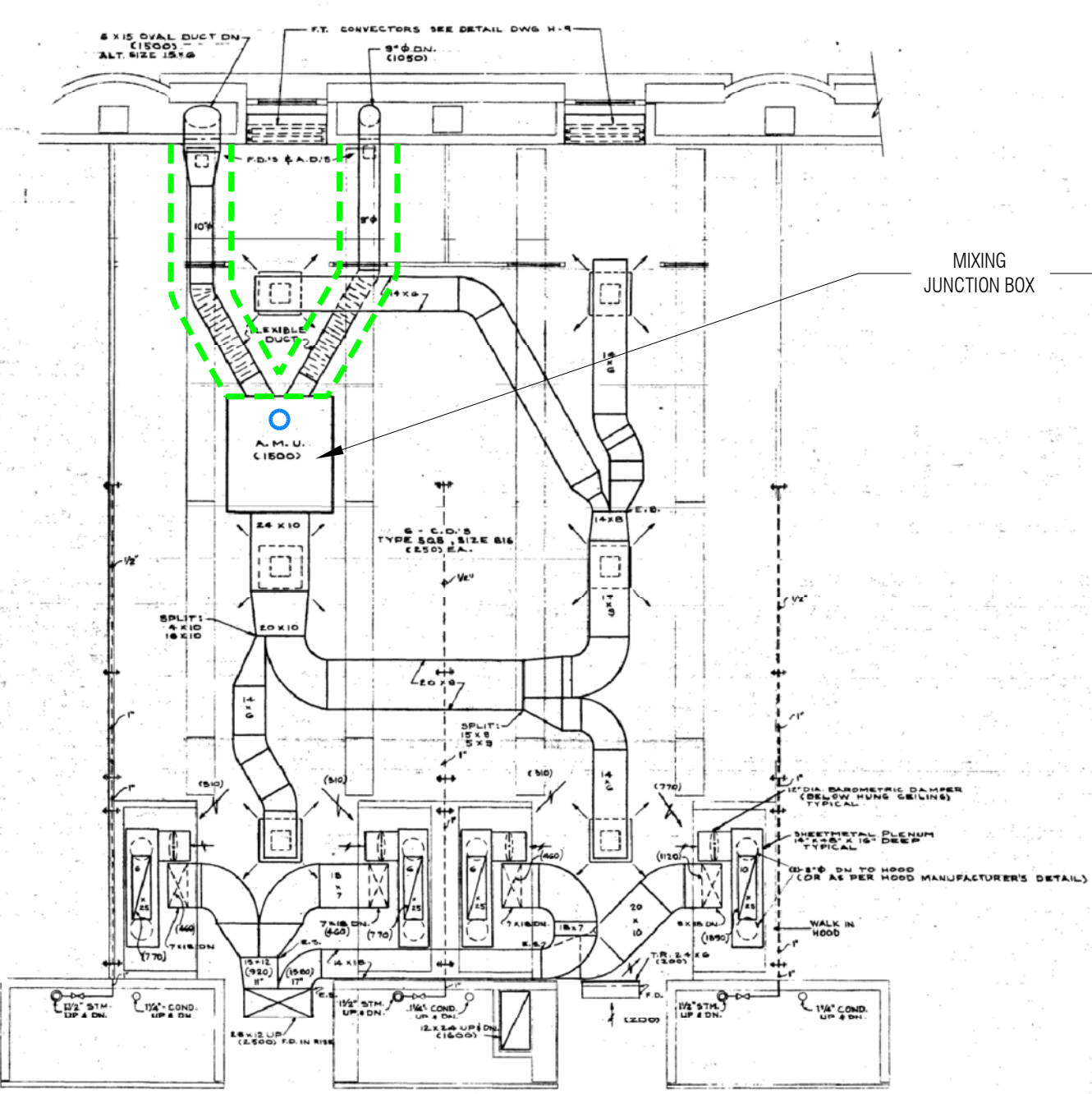


LEGEND

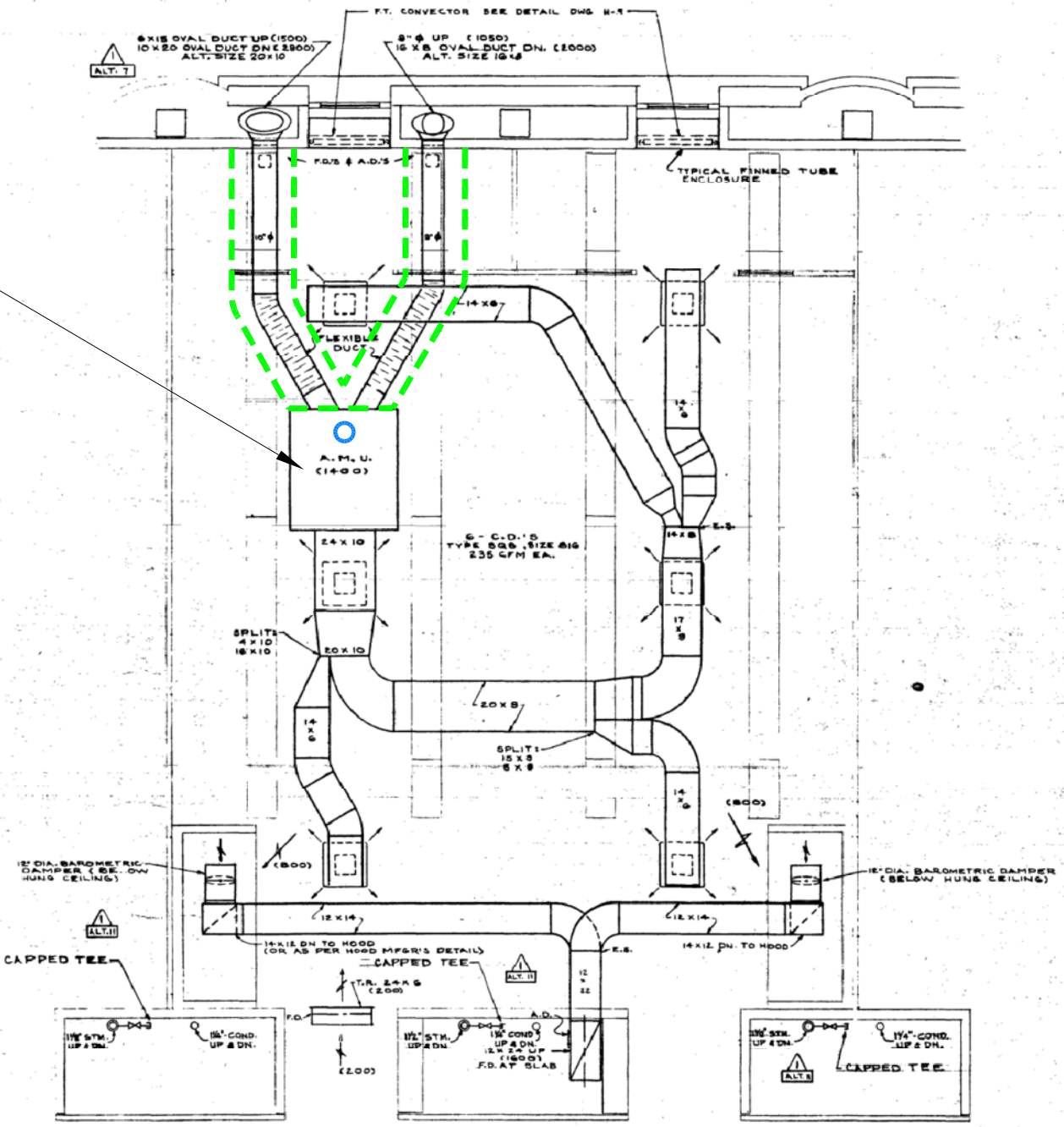
-  VENTILATION DUCTWORK TO BE REMOVED FOR OFF-SITE DISPOSAL AS ≥ 50 ppm PCB WASTE
-  LOCATION OF VERIFICATION WIPE SAMPLE (TYPICAL CONSTRUCTION AREAS)

REFERENCE NOTE:

ORIGINAL DRAWING DETAILS FROM A DRAWING H-7 ENTITLED "TYPICAL LAB DETAILS, DATED 12/12/1962" PROVIDED BY YALE UNIVERSITY.



DETAIL OF 2nd FLOOR LABORATORY RM. No. 223  
SCALE: NOT TO SCALE



TYPICAL 1st FLOOR LABORATORY MODULE  
SCALE: NOT TO SCALE

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REV	DESCRIPTION	DATE

DESIGNED BY: EVR  
CHECKED BY: GJF  
DRAWN BY: EVR  
FIGURE 8-10MG

**TYPICAL VENTILATION  
DUCTWORK CONFIGURATION**

YALE UNIVERSITY KCL  
RENOVATION

PCB REMEDIATION PLAN

JOB NO.: 225540  
DATE: AUGUST 2012  
SCALE: AS NOTED  
SHEET: 0F

**FIGURE 8-1**



## **APPENDIX A: WRITTEN CERTIFICATION**



## Certification

Project – Kline Chemistry Laboratory Renovations  
255 Prospect Street – New Haven, CT  
Yale University

The undersigned owner of the property where the cleanup site is located and the party conducting the cleanup certify that all sampling plans, sampling collection procedures, sample preparation procedures, extraction procedures and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site, are on file at the location indicated below and are available for EPA inspection, as set forth below.

Document Location

Yale EHS Office  
135 College Street, Suite 100  
New Haven, CT 06510

**Property Owner and Party Conducting the Cleanup**

A handwritten signature in black ink, appearing to read "John Bollier", written over a horizontal line.

Authorized Signature

Date August 22, 2012

John Bollier

Name of Authorized representative (print)

Associate Vice President, Yale University

Title

## **APPENDIX B: ANALYTICAL LABORATORY REPORTS AND DATA VALIDATION SUMMARY**

# YALE KLINE KCL - PROJECT SUMMARY

Con-Test Analytical Laboratory Job Numbers: 12C0993 & 12C0994

A modified Tier II validation was performed on the data. The criteria detailed below were used to qualify the data. Raw data were not used to verify the results reported by the laboratory.

Samples were received at 4.2 degrees Celsius. No qualifications will be applied.

## PCBs:

All polychlorinated biphenyl compound (PCB) samples were extracted and analyzed within technical holding times. No qualifications will be applied.

All PCB surrogates met acceptance criteria or were diluted out. No qualifications will be applied.

The PCB method blanks were non-detect (ND) for all target analytes. No qualifications will be applied.

PCB field blank sample KCL-CBBQ-042 (12C0993-32) was ND for all target analytes. No qualifications will be applied.

The PCB matrix spike/matrix spike duplicate (MS/MSD) performed on samples KCL-CBC-015 (12C0993-12) and KCL-CBB-036 (12C0994-01) met recovery (40%-140%) and relative percent difference (RPD) ( $\leq 50\%$ ) acceptance criteria with the following exceptions:

LAB ID	SAMPLE ID	PCB-1016 (%) MS/MS/MSD/MSD	PCB-1260 (%) MS/MS/MSD/MSD	QUALIFIER
12C0993-12	KCL-CBC-015	260/602/324/569	620/611/577/567	None, Aroclor-1254 interference

\*RPD on column 1 was 55.6%

The PCB laboratory control samples (LCS)/laboratory control sample duplicate (LCSD) met acceptance criteria. No qualifications will be applied.

PCB field duplicate samples KCL-CBK-001 (12C0993-01)/KCL-CBKD-040 (12C0993-30) and KCL-CBB-022 (12C0993-18)/KCL-CBBD-041 (12C0993-31) met acceptance criteria. No qualifications will be applied.

The RPD between the column results for all detected PCBs met acceptance criteria ( $\leq 25\%$ ) with the following exceptions:

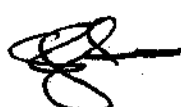
LAB ID	SAMPLE ID	PCB	RPD	QUALIFIER
12C0993-03	KCL-CBK-003	1254	27.9	J
12C0993-14	KCL-CBK-017	1248	29.5	J
12C0994-03	KCL-CBB-021	1254	27.6	J
12C0994-05	KCL-CBR-023	1254	25.9	J

Due to continuing calibration non-conformance on the confirmatory detector, the lower of two results was reported for PCB-1254 in samples [REDACTED] and KCL-CBBD-041 (12C0993-31).

Many samples were analyzed at a dilution due to the high concentration of PCB-1254. Reporting limits are elevated in these samples as a result of the dilutions performed.

Data Check, Inc.  
P.O. Box 29  
81 Meaderboro Road  
New Durham, NH 03855

Gloria J. Switalski:  
President



Date:

6/12/2012

## YALE KLINE CHEMISTRY - PROJECT SUMMARY

Con-Test Analytical Laboratory Job Numbers: 12F0342, 09800337, & 09800339

Analytics Environmental Laboratory Job Numbers: 68098, 68444, & 68983

A modified Tier II validation was performed on the data. The criteria detailed below were used to qualify the data. Raw data were not used to verify the results reported by the laboratory.

Samples were received at 8.2, 9.9, 11.1, and 19.3 degrees Celsius and at "ambient" temperature. All results in all samples will be qualified as estimated (J/UJ) since they were received at the laboratory above 6 degrees Celsius.

### PCBs:

All polychlorinated biphenyl compound (PCB) samples were extracted and analyzed within technical holding times. No qualifications will be applied.

All PCB surrogates met acceptance criteria or were diluted out. No qualifications will be applied.

The PCB method blanks were non-detect (ND) for all target analytes with one exception. PCB-1254 (197 µg/kg) was detected above the reporting limit in the method blank associated with analytical package 68098. Since the sample concentrations in all associated samples were greater than the blank action concentration, no qualifications will be applied to the data.

No PCB field blank samples were submitted with these analytical packages. No qualifications will be applied.

No PCB matrix spike/matrix spike duplicate (MS/MSD) was performed on a sample from these analytical packages. No qualifications will be applied.

The PCB laboratory control samples (LCS)/laboratory control sample duplicate (LCSD) met acceptance criteria. No qualifications will be applied.

No PCB field duplicate samples were submitted with these analytical packages. No qualifications will be applied.

The relative percent difference (RPD) between the column results for all detected PCBs in all Analytics Environmental Laboratory analytical packages met acceptance criteria. No qualifications will be applied. The RPD between the column results for detected PCBs in all ConTest Analytical Laboratory analytical packages were not available. No qualifications will be applied.

Many samples were analyzed at a dilution due to the sample matrix and/or due to the high concentration of PCBs present. Elevated quantitation limits are reported in these samples as a result of the dilutions performed.

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P.O. Box 29  
81 Meaderboro Road  
New Durham, NH 03855

Gloria J. Switalski:  
President



Date: 6/20/2012

## YALE KLINE CHEMISTRY - PROJECT SUMMARY

Con-Test Analytical Laboratory Job Number: 12F0964

A modified Tier II validation was performed on the data. The criteria detailed below were used to qualify the data. Raw data were not used to verify the results reported by the laboratory.

Samples were received at 3.3 degrees Celsius. No qualifications will be applied.

### PCBs:

All polychlorinated biphenyl compound (PCB) samples were extracted and analyzed within technical holding times. No qualifications will be applied.

All PCB surrogates met acceptance criteria or were diluted out. No qualifications will be applied.

The PCB method blanks were non-detect (ND) for all target analytes with one exception. PCB-1254 (0.87 mg/kg) was detected above the reporting limit in the method blank associated with samples KCL-CBK-036 (12F0964-01), KCL-CBK-037 (12F0964-02), and CKL-CBK-038 (12F0964-03). Since the sample concentrations in the associated samples were greater than the blank action concentration, no qualifications will be applied to the data.

The PCB field blank sample, KCL-VBBQ-055 (12F0964-20), was ND for all target analytes. No qualifications will be applied.

No PCB matrix spike/matrix spike duplicate (MS/MSD) was performed on a sample from this analytical package. No qualifications will be applied.

The PCB laboratory control samples (LCS)/laboratory control sample duplicates (LCSD) met acceptance criteria. No qualifications will be applied.

PCB field duplicate samples KCL-VBB-053 (12F0964-18)/KCL-VBBD-054 (12F0964-19) met acceptance criteria. No qualifications will be applied.

The relative percent difference (RPD) between the column results for all detected PCBs met acceptance criteria ( $\leq 25\%$ ) with the following exceptions:


LAB ID	SAMPLE ID	PCB	RPD	QUALIFIER
12F0964-12	KCL-VBC-047	1254	38.5	J
12F0964-15	KCL-VBC-050	1254	34.6	J

According to the case narrative, for Aroclor 1254 in sample KCL-VBC-043 (12F0964-08); "Sample contains two incompletely resolved Aroclors. Aroclor with the closet matching pattern is reported." No qualifications will be applied.

Many samples were analyzed at a dilution due to the sample matrix and/or due to the high concentration of PCBs present. Elevated reporting limits are reported in these samples as a result of the dilutions performed.

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81 Meaderboro Road  
New Durham, NH 03855

Gloria J. Switalski:  
President



Date:

7/10/2012

## YALE KLINE CHEMISTRY - PROJECT SUMMARY

Con-Test Analytical Laboratory Job Number: 12H0008

A modified Tier II validation was performed on the data. The criteria detailed below were used to qualify the data. Raw data were not used to verify the results reported by the laboratory.

Samples were received at 5.5 degrees Celsius. No qualifications will be applied.

### PCBs:

All polychlorinated biphenyl compound (PCB) samples were extracted and analyzed within technical holding times. No qualifications will be applied.

All PCB surrogates met acceptance criteria. No qualifications will be applied.

The PCB method blanks were non-detect (ND) for all target analytes. No qualifications will be applied to the data.

The PCB field blank sample, KCL-FB-7.31.12 (12H0008-16), was ND for all target analytes. No qualifications will be applied.

No PCB matrix spike/matrix spike duplicate (MS/MSD) was performed on a sample from this analytical package. No qualifications will be applied.

The PCB laboratory control samples (LCS)/laboratory control sample duplicates (LCSD) met acceptance criteria. No qualifications will be applied.

PCB field duplicate samples KCL-CBC-213 (12H0008-14)/KCL-CBC-214 (12H0008-15) met acceptance criteria. No qualifications will be applied.

The relative percent difference (RPD) between the column results for all detected PCBs met acceptance criteria ( $\leq 25\%$ ) with the following exceptions:

LAB ID	SAMPLE ID	PCB	RPD	QUALIFIER
12H0008-06	KCL-VBC-205	1260	25.3	J
12H0008-14	KCL-CBC-213	1254	59.6	J
12H0008-15	KCL-CBC-214	1254	36.1	J

According to the case narrative, for Aroclor 1260 in sample KCL-CBC-210 (12H0008-11); "Sample contains two incompletely resolved Aroclors. Aroclor with the closest matching pattern is reported." No qualifications will be applied.

One sample was analyzed at a 2-fold dilution due to the sample matrix and/or due to the high concentration of PCBs present. Elevated reporting limits are reported in this sample as a result of the dilution performed.

Data Check, Inc.  
P.O. Box 29  
81 Meaderboro Road  
New Durham, NH 03855

Gloria J. Switalski:  
President



Date:

08/14/2012



39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL 413/525-2332

REPORT DATE 1/13/2009

YALE UNIVERSITY  
135 COLLEGE STREET  
NEW HAVEN, CT 06510  
ATTN: STEVEN MURDZIA

CONTRACT NUMBER:  
PURCHASE ORDER NUMBER:

PROJECT NUMBER:

#### ANALYTICAL SUMMARY

LIMS BAT #: LIMIT-22476

JOB NUMBER: -

PROJECT LOCATION: KCL

FIELD SAMPLE #	LAB ID	MATRIX	SAMPLE DESCRIPTION	TEST	Subcontract Lab (if any) Cert. Nos.
KCL1	09B00337	SOLID	Ext. Window Caulk	8082 solid	
KCL3	09B00339	SOLID	Ext. Entry Caulk	8082 solid	

The results of analyses performed are based on samples as submitted to the laboratory and relate only to the items collected and tested.

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations. AIHA accreditations only apply to NIOSH methods and Environmental Lead Analyses.

AIHA 100033	AIHA ELLAP (LEAD) 100033	NORTH CAROLINA CERT. #652
MASSACHUSETTS MA0100	NEW HAMPSHIRE NELAP 2516	NEW JERSEY NELAP NJ MA007 (AIR)
CONNECTICUT PH-0567	VERMONT DOH (LEAD) No. LL015036	FLORIDA DOH E871027 (AIR)
NEW YORK ELAP/NELAP 10899	RHODE ISLAND (LIC. No. 112)	

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

*Edward Denson* 1/19/09

SIGNATURE

DATE

Tod Kopyscinski  
Air Laboratory Manager

Michael Erickson  
Assistant Laboratory Director

Edward Denson  
Technical Director

Daren Damboragian  
Organics Department Supervisor





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STEVEN MURDZIA  
YALE UNIVERSITY  
135 COLLEGE STREET  
NEW HAVEN, CT 06510

1/13/2009  
Page 1 of 4

Purchase Order No.:

Project Location: KCL  
Date Received: 1/7/2009  
Field Sample #: KCL1

LIMS-BAT #: LIMIT-22476  
Job Number: -

Sample ID: 09B00337

‡Sampled: 1/6/2009  
Ext. Window Caulk

Sample Matrix: SOLID

	Units	Results	Date Analyzed	Analyst	RL	SPEC Limit Lo Hi	P/F
PCB 1016	mg/kg	ND	01/12/09	JMR	7580		
PCB-1221	mg/kg	ND	01/12/09	JMR	7580		
PCB-1232	mg/kg	ND	01/12/09	JMR	7580		
PCB-1242	mg/kg	ND	01/12/09	JMR	7580		
PCB-1248	mg/kg	ND	01/12/09	JMR	7580		
PCB-1254	mg/kg	71300	01/12/09	JMR	7580		
PCB-1260	mg/kg	ND	01/12/09	JMR	7580		
PCB 1262	mg/kg	ND	01/12/09	JMR	7580		
PCB 1268	mg/kg	ND	01/12/09	JMR	7580		
Extraction Date PCBs		1/8/2009	01/12/09	JMR			

Field Sample #: KCL2

Sample ID: 09B00338

‡Sampled: 1/6/2009  
Ext. Bldg. Expansion Caulk

Sample Matrix: SOLID

	Units	Results	Date Analyzed	Analyst	RL	SPEC Limit Lo Hi	P/F
PCB 1016	mg/kg	ND	01/12/09	JMR	9180		
PCB-1221	mg/kg	ND	01/12/09	JMR	9180		
PCB-1232	mg/kg	ND	01/12/09	JMR	9180		
PCB-1242	mg/kg	ND	01/12/09	JMR	9180		
PCB-1248	mg/kg	ND	01/12/09	JMR	9180		
PCB-1254	mg/kg	98900	01/12/09	JMR	9180		
PCB-1260	mg/kg	ND	01/12/09	JMR	9180		
PCB 1262	mg/kg	ND	01/12/09	JMR	9180		
PCB 1268	mg/kg	ND	01/12/09	JMR	9180		
Extraction Date PCBs		1/8/2009	01/12/09	JMR			

RL = Reporting Limit

ND = Not Detected at or above the Reporting Limit

NM = Not Measured

\* = See end of report for comments and notes applying to this sample

‡ = See attached chain-of-custody record for time sampled

SPEC LIMIT = a client specified recommended or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.



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STEVEN MURDZIA  
YALE UNIVERSITY  
135 COLLEGE STREET  
NEW HAVEN, CT 06510

1/13/2009  
Page 2 of 4

Purchase Order No.:

Project Location: KCL  
Date Received: 1/7/2009  
Field Sample #: KCL3

LIMS-BAT #: LIMIT-22476  
Job Number: -

Sample ID: 09B00339

‡Sampled: 1/6/2009  
Ext. Entry Caulk

Sample Matrix: SOLID

	Units	Results	Date Analyzed	Analyst	RL	SPEC Limit Lo Hi	P/F
PCB 1016	mg/kg	ND	01/12/09	JMR	9390		
PCB-1221	mg/kg	ND	01/12/09	JMR	9390		
PCB-1232	mg/kg	ND	01/12/09	JMR	9390		
PCB-1242	mg/kg	ND	01/12/09	JMR	9390		
PCB-1248	mg/kg	ND	01/12/09	JMR	9390		
PCB-1254	mg/kg	70500	01/12/09	JMR	9390		
PCB-1260	mg/kg	ND	01/12/09	JMR	9390		
PCB 1262	mg/kg	ND	01/12/09	JMR	9390		
PCB 1268	mg/kg	ND	01/12/09	JMR	9390		
Extraction Date PCBs		1/8/2009	01/12/09	JMR			

Field Sample #: KCL4

Sample ID: 09B00340

‡Sampled: 1/6/2009  
Wall Caulk

Sample Matrix: SOLID

	Units	Results	Date Analyzed	Analyst	RL	SPEC Limit Lo Hi	P/F
PCB 1016	mg/kg	ND	01/12/09	JMR	9.48		
PCB-1221	mg/kg	ND	01/12/09	JMR	9.48		
PCB-1232	mg/kg	ND	01/12/09	JMR	9.48		
PCB-1242	mg/kg	ND	01/12/09	JMR	9.48		
PCB-1248	mg/kg	ND	01/12/09	JMR	9.48		
PCB-1254	mg/kg	31.2	01/12/09	JMR	9.48		
PCB-1260	mg/kg	ND	01/12/09	JMR	9.48		
PCB 1262	mg/kg	ND	01/12/09	JMR	9.48		
PCB 1268	mg/kg	ND	01/12/09	JMR	9.48		
Extraction Date PCBs		1/8/2009	01/12/09	JMR			

RL = Reporting Limit

ND = Not Detected at or above the Reporting Limit

NM = Not Measured

\* = See end of report for comments and notes applying to this sample

‡ = See attached chain-of-custody record for time sampled

SPEC LIMIT = a client specified recommended or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.

MOAT



39 Spruce Street ° East Longmeadow, MA 01028 ° FAX 413/525-6405 ° TEL. 413/525-2332

STEVEN MURDZIA  
YALE UNIVERSITY  
135 COLLEGE STREET  
NEW HAVEN, CT 06510

1/13/2009  
Page 3 of 4

Purchase Order No.:

Project Location: KCL  
Date Received: 1/7/2009

LIMS-BAT #: LIMS-22476  
Job Number: -

Analytical Method:  
SW846 8081/8082

SAMPLES ARE EXTRACTED BY PRESSURIZED FLUID EXTRACTION (SW846 3545) OR MICROWAVE (SW846 3546),  
CONCENTRATED, AND ANALYZED BY GAS CHROMATOGRAPHY WITH ELECTRON CAPTURE DETECTION.

RL = Reporting Limit

NO = Not Detected at or above the Reporting Limit

NM = Not Measured

\* = See end of report for comments and notes applying to this sample

‡ = See attached chain-of-custody record for time sampled

SPEC LIMIT = a client specified recommended or  
regulatory level for comparison with data to  
determine PASS (P) or FAIL (F) condition of results.



39 Spruce Street ° East Longmeadow, MA 01028 ° FAX 413/525-6405 ° TEL. 413/525-2332

STEVEN MURDZIA  
YALE UNIVERSITY  
135 COLLEGE STREET  
NEW HAVEN, CT 06510

Purchase Order No.:

Project Location: KCL  
Date Received: 1/7/2009

1/13/2009  
Page 4 of 4

LIMS-BAT #: LIMIT-22476  
Job Number: -

\*\* END OF REPORT \*\*

RL = Reporting Limit

ND = Not Detected at or above the Reporting Limit

NM = Not Measured

\* = See end of report for comments and notes applying to this sample

‡ = See attached chain-of-custody record for time sampled

SPEC LIMIT = a client specified recommended or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.



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### QC SUMMARY REPORT

SAMPLE QC: Sample Results with Duplicates

Sample Matrix Spikes and Matrix Spike Duplicates

BATCH QC: Lab fortified Blanks and Duplicates

Standard Reference Materials and Duplicates

Method Blanks

Report Date: 1/13/2009

Lims Bat #: LMT-22476

Page 1 of 3

QC Batch Number: GC/ECD-12063

Sample Id	Analysis	QC Analysis	Values	Units	Limits
09B00337	Decachlorobiphenyl	Surrogate Recovery	N.M.	%	30-150
	Tetrachloro-m-Xylene	Surrogate Recovery	N.M.	%	30-150
09B00338	Decachlorobiphenyl	Surrogate Recovery	N.M.	%	30-150
	Tetrachloro-m-Xylene	Surrogate Recovery	N.M.	%	30-150
09B00339	Decachlorobiphenyl	Surrogate Recovery	N.M.	%	30-150
	Tetrachloro-m-Xylene	Surrogate Recovery	N.M.	%	30-150
09B00340	Decachlorobiphenyl	Surrogate Recovery	148.5	%	30-150
	Tetrachloro-m-Xylene	Surrogate Recovery	130.5	%	30-150
BLANK-128419	PCB-1232	Blank	<1.00	mg/kg	
	PCB-1242	Blank	<1.00	mg/kg	
	PCB-1254	Blank	<1.00	mg/kg	
	PCB-1260	Blank	<1.00	mg/kg	
	PCB-1248	Blank	<1.00	mg/kg	
	PCB-1221	Blank	<1.00	mg/kg	
	PCB 1016	Blank	<1.00	mg/kg	
	PCB 1262	Blank	<1.00	mg/kg	
	PCB 1268	Blank	<1.00	mg/kg	
LFBLANK-90456	PCB-1260	Lab Fort Blank Amt.	10.000	mg/kg	
		Lab Fort Blk. Found	10.545	mg/kg	
		Lab Fort Blk. % Rec.	105.450	%	40-140
		Dup Lab Fort Bl Amt.	10.000	mg/kg	
		Dup Lab Fort Bl. Fnd	10.845	mg/kg	
		Dup Lab Fort Bl %Rec	108.450	%	
		Lab Fort Blank Range	3.000	units	
		Lab Fort Bl. Av. Rec	106.950	%	
		LFBL Duplicate RPD	2.805	%	0-30
	PCB 1016	Lab Fort Blank Amt.	10.000	mg/kg	
		Lab Fort Blk. Found	10.245	mg/kg	
		Lab Fort Blk. % Rec.	102.450	%	40-140
		Dup Lab Fort Bl Amt.	10.000	mg/kg	
		Dup Lab Fort Bl. Fnd	11.855	mg/kg	
		Dup Lab Fort Bl %Rec	118.550	%	
		Lab Fort Blank Range	16.100	units	
		Lab Fort Bl. Av. Rec	110.500	%	
		LFBL Duplicate RPD	14.570	%	0-30



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#### QC SUMMARY REPORT

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Standard Reference Materials and Duplicates

Method Blanks

Report Date: 1/13/2009

Lims Bat #: LIMIT-22476

Page 2 of 3

#### NOTES:

QC Batch No. : GC/ECD-12063

Sample ID : 09B00337

Analysis : Decachlorobiphenyl

SURROGATE CONCENTRATION BELOW DETECTION LIMIT DUE TO DILUTION REQUIRED FOR SAMPLE ANALYSIS.

QC Batch No. : GC/ECD-12063

Sample ID : 09B00337

Analysis : Tetrachloro-m-Xylene

SURROGATE CONCENTRATION BELOW DETECTION LIMIT DUE TO DILUTION REQUIRED FOR SAMPLE ANALYSIS.

QC Batch No. : GC/ECD-12063

Sample ID : 09B00338

Analysis : Decachlorobiphenyl

SURROGATE CONCENTRATION BELOW DETECTION LIMIT DUE TO DILUTION REQUIRED FOR SAMPLE ANALYSIS.

QC Batch No. : GC/ECD-12063

Sample ID : 09B00338

Analysis : Tetrachloro-m-Xylene

SURROGATE CONCENTRATION BELOW DETECTION LIMIT DUE TO DILUTION REQUIRED FOR SAMPLE ANALYSIS.

QC Batch No. : GC/ECD-12063

Sample ID : 09B00339

Analysis : Decachlorobiphenyl

SURROGATE CONCENTRATION BELOW DETECTION LIMIT DUE TO DILUTION REQUIRED FOR SAMPLE ANALYSIS.

QC Batch No. : GC/ECD-12063

Sample ID : 09B00339

Analysis : Tetrachloro-m-Xylene

SURROGATE CONCENTRATION BELOW DETECTION LIMIT DUE TO DILUTION REQUIRED FOR SAMPLE ANALYSIS.



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#### QC SUMMARY REPORT

SAMPLE QC: Sample Results with Duplicates

BATCH QC: Lab fortified Blanks and Duplicates

Sample Matrix Spikes and Matrix Spike Duplicates

Standard Reference Materials and Duplicates

Method Blanks

Report Date:

1/13/2009

Lims Bat #: LIMS-22476

Page 3 of 3

#### QUALITY CONTROL DEFINITIONS AND ABBREVIATIONS

QC BATCH NUMBER	This is the number assigned to all samples analyzed together that would be subject to comparison with a particular set of Quality Control Data.
LIMITS	Upper and Lower Control Limits for the QC ANALYSIS Reported. All values normally would fall within these statistically determined limits, unless there is an unusual circumstance that would be documented in a NOTE appearing on the last page of the QC SUMMARY REPORT. Not all QC results will have Limits defined.
Sample Amount	Amount of analyte found in a sample.
Blank	Method Blank that has been taken through all the steps of the analysis.
LEBLANK	Laboratory Fortified Blank (a control sample)
STDADD	Standard Added (a laboratory control sample)
Matrix Spk Amt Added	Amount of analyte spiked into a sample
MS Amt Measured	Amount of analyte found including amount that was spiked
Matrix Spike % Rec.	% Recovery of spiked amount in sample.
Duplicate Value	The result from the Duplicate analysis of the sample.
Duplicate RPD	The Relative Percent Difference between two Duplicate Analyses.
Surrogate Recovery	The % Recovery for non-environmental compounds (surrogates) spiked into samples to determine the performance of the analytical methods.
Sur. Recovery (ELCD)	Surrogate Recovery on the Electrolytic Conductivity Detector.
Sur. Recovery (PID)	Surrogate Recovery on the Photoionization Detector.
Standard Measured	Amount measured for a laboratory control sample
Standard Amt Added	Known value for a laboratory control sample
Standard % Recovery	% recovered for a laboratory control sample with a known value.
Lab Fort Blank Amt	Laboratory Fortified Blank Amount Added
Lab Fort Blk. Found	Laboratory Fortified Blank Amount Found
Lab Fort Blk % Rec	Laboratory Fortified Blank % Recovered
Dup Lab Fort Bl Amt	Duplicate Laboratory Fortified Blank Amount Added
Dup Lab Fort Bl Fnd	Duplicate Laboratory Fortified Blank Amount Found
Dup Lab Fort Bl % Rec	Duplicate Laboratory Fortified Blank % Recovery
Lab Fort Blank Range	Laboratory Fortified Blank Range (Absolute value of difference between recoveries for Lab Fortified Blank and Lab Fortified Blank Duplicate).
Lab Fort Bl. Av. Rec.	Laboratory Fortified Blank Average Recovery
Duplicate Sample Amt	Sample Value for Duplicate used with Matrix Spike Duplicate
MSD Amount Added	Matrix Spike Duplicate Amount Added (Spiked)
MSD Amt Measured	Matrix Spike Duplicate Amount Measured
MSD % Recovery	Matrix Spike Duplicate % Recovery
MSD Range	Absolute difference between Matrix Spike and Matrix Spike Duplicate Recoveries



Phone: 413-525-2332

Fax: 413-525-6405

Email: info@contestlabs.com

www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 SPRUCE ST, 2ND FLOOR  
EAST LONGMEADOW, MA 01028

Page 1 of 1

Company Name: Yale OEHS

Address: 135 College St, Ste 100

New Haven, CT 06510

Attention: Steven Murdzia

Project Location: KCL

Sampled By: S. Murdzia

Proposal Provided? (For Billing purposes)

☐ yes ☐ no

proposal date

Telephone: (203) 785-2236

Project #

Client PO #

DATA DELIVERY (check one):

☐ FAX ☒ EMAIL ☐ WEBSITE CLIENT

Fax #:

Email: steven.murdzia@yale.edu

Format: ☐ EXCEL ☒ PDF ☐ GIS KEY

Date Sampled

Start Date/Time

Stop Date/Time

Comp- osite

Grab

Matrix Code

1/6/09

1/6/09

✓

S

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

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✓

✓

ANALYSIS REQUESTED

Count Code

AS=Asbestos, glass

CS=Glass

PE=Plastic

ST=Stainless

Y=Yellow

S=Supernatant

T=Leachate bag

O=Other

Comments:

Matrix Code:

GW= groundwater

WW= wastewater

DW= drinking water

A= air

S= soil/solid

SL= sludge

O= other

Preservation Codes:

I= Ice

H= HCL

M= Methanol

N= Nitric Acid

S= Sulfuric Acid

B= Sodium bisulfate

O= Other

X= Na hydroxide

T= Na thiosulfate

Special Requirements or D.L.s:

Regulations? ☒ Y ☐ N

Date Enhancement Project? ☐ Y ☒ N

(IMA MCP sites only)

Turnaround

24 Hour ☐

48 Hour ☐

72 Hour ☐

Std. ☒

Other\*\* ☐

Date needed\*\*

Require lab approval.

Date/Time:

Date/Time:

Date/Time:

Date/Time:

Date/Time:

Relinquished by: (signature)

Received by: (signature)

Received by: (signature)

Received by: (signature)

Received by: (signature)

Received by: (signature)

Received by: (signature)

Received by: (signature)

Con-Test Laboratory is the ONLY independent laboratory in all of New England with both prestigious AIHA and NELAP Certifications!



www.contestlabs.com



39 Spruce St.  
East Longmeadow, MA.  
01028  
P: 413-525-2332  
F: 413-525-8405

### Sample Receipt Checklist

CLIENT NAME: Vale RECEIVED BY: DE DATE: 1/7/08

1) Was the chain(s) of custody relinquished and signed? Yes No

2) Does the chain agree with the samples? Yes No

If not, explain:

3) Are all the samples in good condition? Yes No

If not, explain:

4) How were the samples received:

On Ice ☒

Direct from Sampling ☐

Ambient ☒

In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun \_\_\_\_\_

5) Are there Dissolved samples for the lab to filter? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any samples "On Hold"? Yes No Stored where: \_\_\_\_\_

7) Are there any RUSH or SHORT HOLDING TIME samples? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

8) Location where samples are stored: 19

Permission to subcontract samples? Yes No  
(Walk-in clients only) if not already approved

Client Signature: \_\_\_\_\_

### Containers sent in to Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz clear jar	
500 mL Amber		4 oz clear jar	
250 mL Amber (8oz amber)		2 oz clear jar	
1 Liter Plastic		Other glass jar	
500 mL Plastic		Plastic Bag / Ziploc	<u>4</u>
250 mL plastic		Air Cassette	
40 mL Vial - type listed below		Brass Sleeves	
Colisure / bacteria bottle		Tubes	
Dissolved Oxygen bottle		Summa Cans	
Flashpoint bottle		Regulators	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_

# Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_

# Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen: \_\_\_\_\_

Do all samples have the proper pH: Yes No N/A



195 Commerce Way Suite E  
Portsmouth, New Hampshire 03801  
603-436-5111 Fax 603-430-2151  
800-929-9906  
www.analyticslab.com

November 1, 2010

Mr. Rob Klein  
Yale University Environmental Health & Safety  
135 College Street  
New Haven CT 06510

**RE:        Analytical Results Case Narrative  
             Analytics # 68098  
             KCL Mock Up**

Dear Mr. Klein;

Enclosed please find the analytical results for samples submitted for the above-mentioned project. The attached Cover Page lists the sample IDs, Lab tracking numbers and collection dates for the samples included in this deliverable.

Samples were analyzed Polychlorinated Biphenyls (PCBs) by EPA Method 8082.

Unless otherwise noted in the Non-conformance Summary listed below, all of the quality control (QC) criteria including initial calibration, calibration verification, surrogate recovery, holding time and method accuracy/precision for these analyses were within acceptable limits.

This Level II data package has been assembled in the following order:

- Case Narrative/Non-Conformance Summary
- Sample Log Sheet - Cover Page
- PCB Form 1 Data Sheet for Samples and Blanks
- Chromatograms
- PCB Form 10 Confirmation Results
- PCB Form 3 MS/MSD (LCS) Recoveries
- Chain of Custody (COC) Forms

## QC NON-CONFORMANCE SUMMARY

### Sample Receipt:

The cooler temperature upon receipt was 19.3<sup>0</sup> C upon receipt at the laboratory. The client was contacted and instructed the laboratory to proceed with analysis.

One sample 68098-7 (10186 KCL 110 ext) was supplied in the cooler and was not listed on the Chain of Custody (COC). In addition one sample 68098-6 had the station ID incorrectly written on the COC. The client was contacted and sample 68098-7 was added to the COC and the station ID was corrected for 68098-6.

### PCBs by EPA Method 8082:

All samples in this SDG required dilution due to the high concentrations of PCBs detected in the samples.

The laboratory blank B102510PSOX had PCB 1254 detected. PCB 1254 was detected in all samples at levels greater than 10X the level detected in the blank. Results were reported without qualification.

The closing continuing calibration standards (M32521Sc & M32522SC) had recoveries greater than 115% but less than 120% on column#2. Column#1 was in control for all analytes. Results were reported without qualification.

Sincerely,  
ANALYTICS Environmental Laboratory, LLC



Stephen Knollmeyer  
Laboratory Director

Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

**Report Number: 68098**

**Revision: Rev. 0**

**Re: KCL Mock Up (Project No: 102010)**

Enclosed are the results of the analyses on your sample(s). Samples were received on 21 October 2010 and analyzed for the tests listed. Samples were received in acceptable condition, with the exceptions noted below or on the chain of custody. These results pertain to samples as received by the laboratory and for the analytical tests requested on the chain of custody. The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. Please see individual reports for specific methodologies and references.

<u>Lab Number</u>	<u>Sample Date</u>	<u>Station Location</u>	<u>Analysis</u>	<u>Comments</u>
68098-1	10/18/10	10181 KCL 114 int	EPA 8082 (PCBs only)	
68098-2	10/18/10	10182 KCL 110 int	EPA 8082 (PCBs only)	
68098-3	10/18/10	10183 KCL 110 int	EPA 8082 (PCBs only)	
68098-4	10/18/10	10184 KCL 114 ext	EPA 8082 (PCBs only)	
68098-5	10/18/10	10185 KCL 110 ext	EPA 8082 (PCBs only)	
68098-6	10/18/10	10187 KCL ext glaz	EPA 8082 (PCBs only)	
68098-7	10/18/10	10186 KCL 110 ext	EPA 8082 (PCBs only)	

**Sample Receipt Exceptions: None**

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Virginia, Maryland, and is accredited by the Department of Defense (DOD) ELAP program. A list of actual certified parameters is available upon request.

If you have any questions on these results, please do not hesitate to contact us.

Authorized signature

  
Stephen L. Knollmeyer Lab. Director

Date

11/1/2010

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### Surrogate Compound Limits

Matrix: Units:	Aqueous % Recovery	Solid % Recovery	Method
<b>Volatile Organic Compounds - Drinking Water</b>			
1,4-Difluorobenzene	70-130		EPA 524.2
Bromofluorobenzene	70-130		
1,2-Dichlorobenzene-d4	70-130		
<b>Volatile Organic Compounds</b>			
1,2-Dichloroethane-d4	70-120	70-120	EPA 624/8260B
Toluene-d8	85-120	85-120	
Bromofluorobenzene	75-120	75-120	
<b>Semi-Volatile Organic Compounds</b>			
2-Fluorophenol	20-110	35-105	EPA 625/8270C
d5-Phenol	15-110	40-100	
d5-nitrobenzene	40-110	35-100	
2-Fluorobiphenyl	50-110	45-105	
2,4,6-Tribromophenol	40-110	40-125	
d14-p-terphenyl	50-130	30-125	
<b>PAH's by SIM</b>			
d5-nitrobenzene	21-110	35-110	EPA 8270C
2-Fluorobiphenyl	36-121	45-105	
d14-p-terphenyl	33-141	30-125	
<b>Pesticides and PCBs</b>			
2,4,5,6-Tetrachloro-m-xylene (TCX)	46-122	40-130	EPA 608/8082
Decachlorobiphenyl (DCB)	40-135	40-130	
<b>Herbicides</b>			
Dichloroacetic acid (DCAA)	30-150	30-150	
<b>Gasoline Range Organics/TPH Gasoline</b>			
Trifluorotoluene TFT (FID)	60-140	60-140	MEDEP 4217/EPA 8015
Bromofluorobenzene (BFB) (FID)	60-140	60-140	
Trifluorotoluene TFT (PID)	60-140	60-140	
Bromofluorobenzene (BFB) (PID)	60-140	60-140	
<b>Diesel Range Organics/TPH Diesel</b>			
m-terphenyl	60-140	60-140	MEDEP 4125/EPA 8015/CT ETPH
<b>Volatile Petroleum Hydrocarbons</b>			
2,5-Dibromotoluene (PID)	70-130	70-130	MADEP VPH May 2004 Rev1.1
2,5-Dibromotoluene (FID)	70-130	70-130	
<b>Extracatable Petroleum Hydrocarbons</b>			
1-chloro-octadecane (aliphatic)	40-140	40-140	MADEP EPH May 2004 Rev1.1
o-Terphenyl (aromatic)	40-140	40-140	
2-Fluorobiphenyl (Fractionation)	40-140	40-140	
2-Bromonaphthalene (fractionation)	40-140	40-140	

## PCB DATA SUMMARIES

Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

November 1, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** Lab QC

**Lab Sample ID:** B102510PSOX RR  
**Matrix:** Soil  
**Percent Solid:** N/A  
**Dilution Factor:** 1.0  
**Collection Date:**  
**Lab Receipt Date:**  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	<b>197</b>
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	96	%
Decachlorobiphenyl	68	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

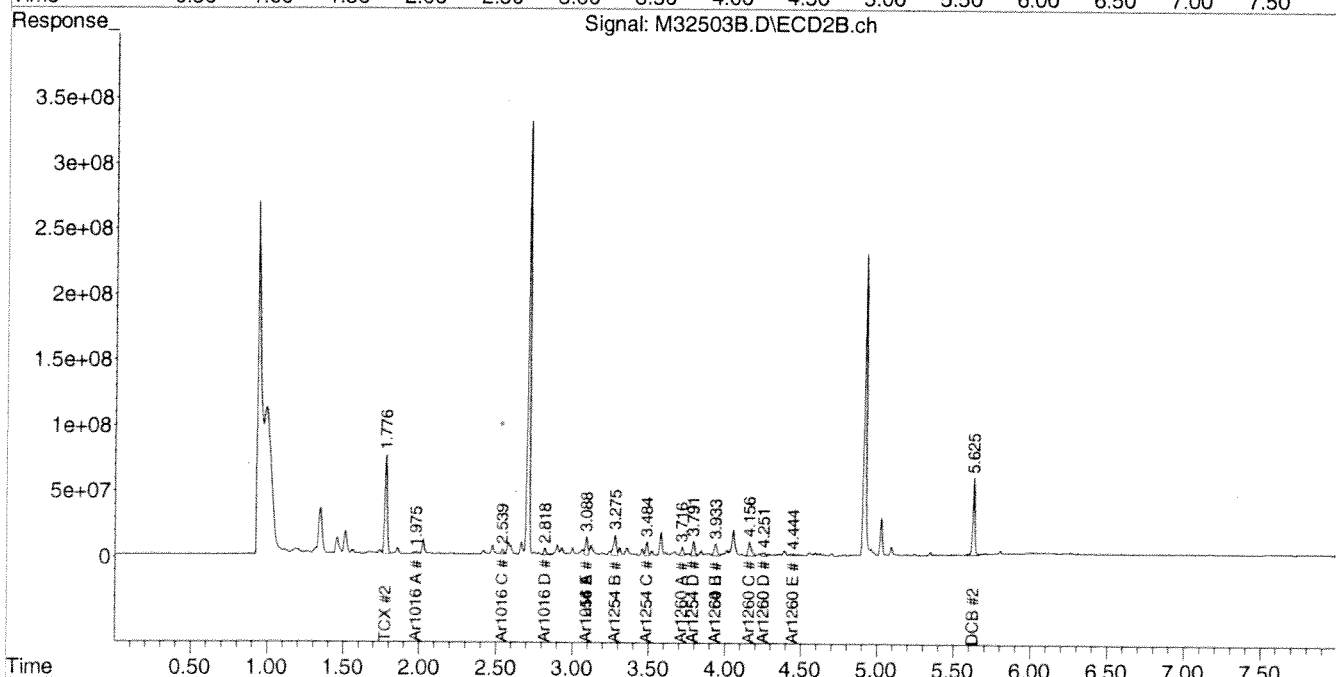
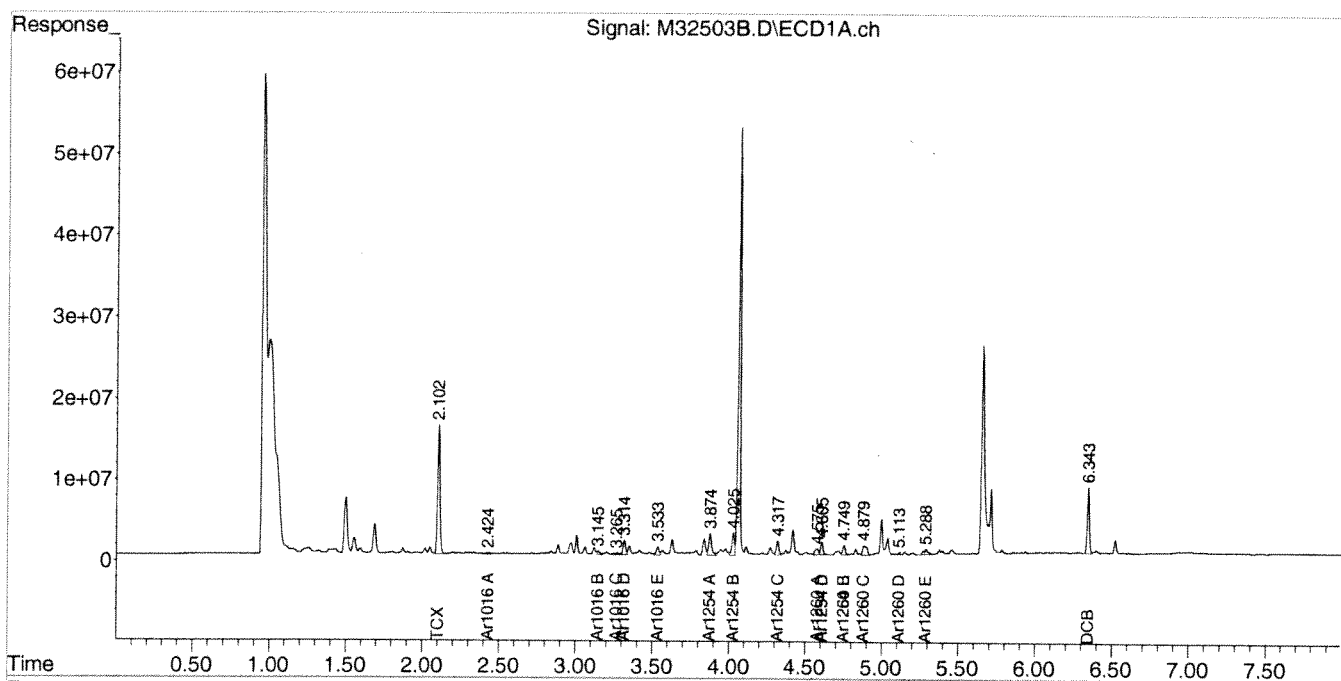
Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32503B.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 2:30 pm  
Operator : JK  
Sample : B102510PSOX,RR,,A/C  
Misc : SOIL  
ALS Vial : 6 Sample Multiplier: 1

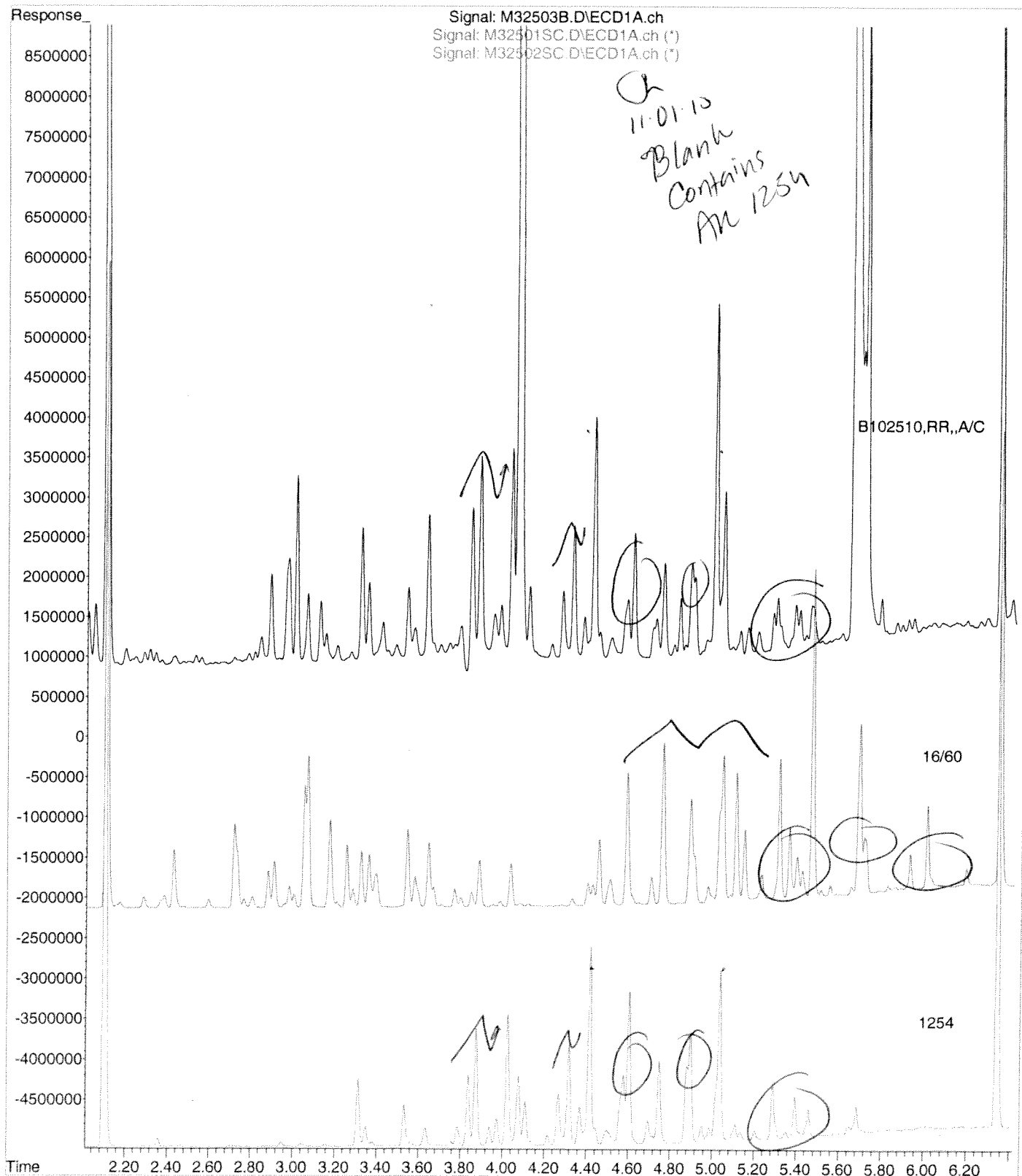
Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 09:59:57 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:29:57 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um





File :C:\msdchem\1\DATA\102910-M\M32503B.D  
Operator : JK  
Acquired : 29 Oct 2010 2:30 pm using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: B102510PSOX,RR,,A/C  
Misc Info : SOIL  
Vial Number: 6



Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

November 1, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

---

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10181 KCL 114 int

**Lab Sample ID:** 68098-1  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 450000  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit µg/kg	Results µg/kg
PCB-1016	14850000	U
PCB-1221	14850000	U
PCB-1232	14850000	U
PCB-1242	14850000	U
PCB-1248	14850000	U
PCB-1254	14850000	<b>209000000</b>
PCB-1260	14850000	U
<b>Surrogate Standard Recovery</b>		
2,4,5,6-Tetrachloro-m-xylene	*	%
Decachlorobiphenyl	*	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-1,1:50000,,A/C
Column ID: 0.25 mm	Data File: M32513.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 450119.6
Column ID: 0.25 mm	

Column #1		Column #2	
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD #
PCB 1254	183219633	209172131	13.2

# Column to be used to flag RPD values greater than QC limit of 40%

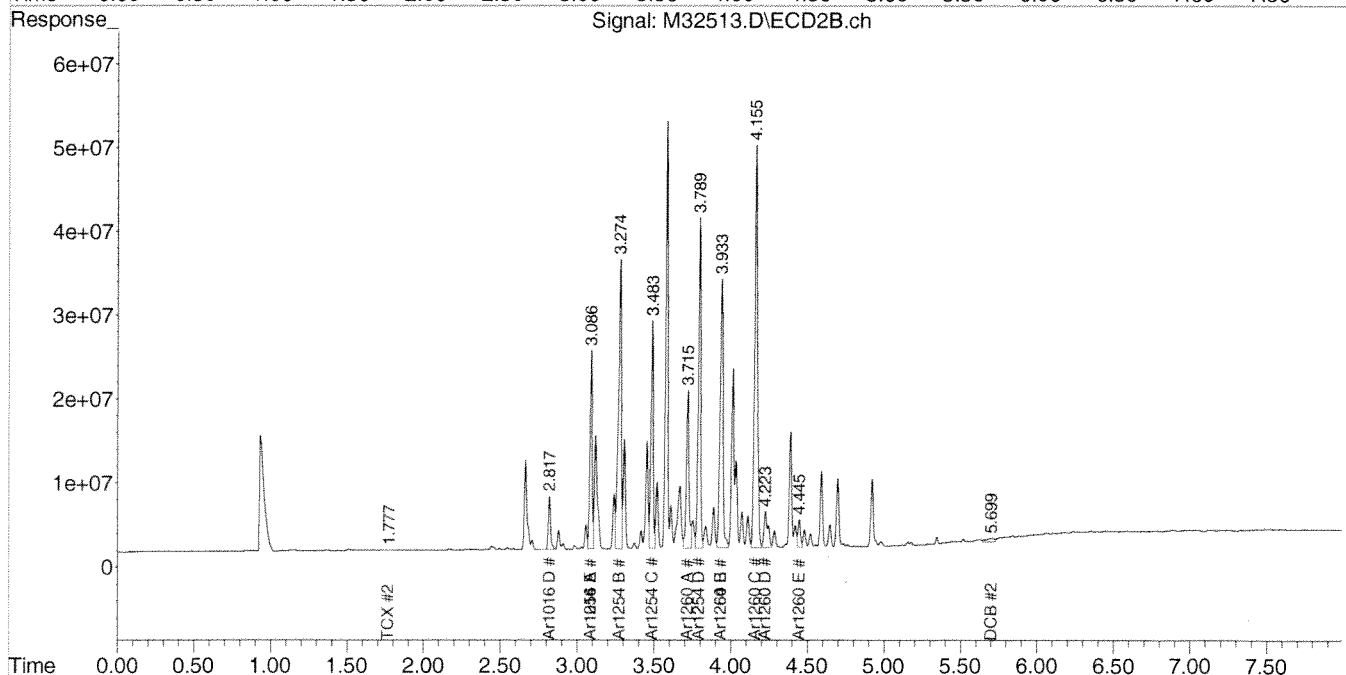
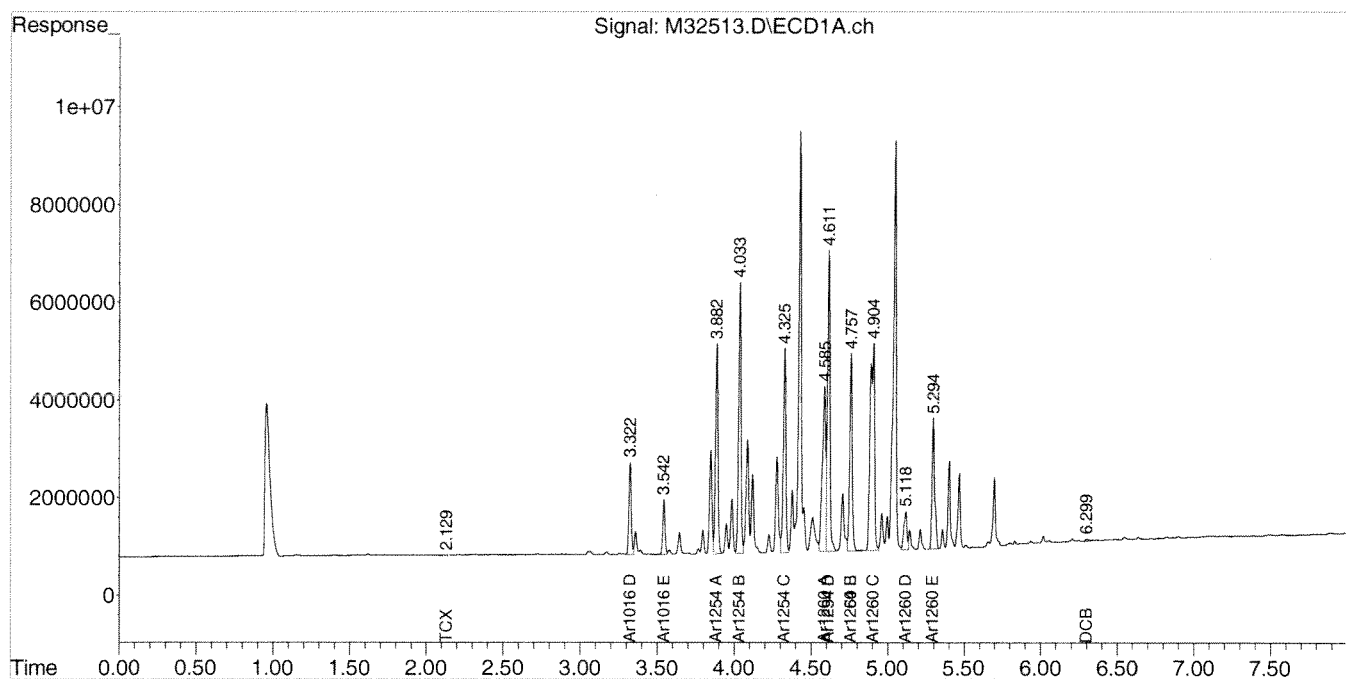
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32513.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 4:25 pm  
Operator : JK  
Sample : 68098-1,1:50000,,A/C  
Misc : SOIL  
ALS Vial : 16 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:05 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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November 1, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

---

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10182 KCL 110 int

**Lab Sample ID:** 68098-2  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 831000  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	27423000	U
PCB-1221	27423000	U
PCB-1232	27423000	U
PCB-1242	27423000	U
PCB-1248	27423000	U
PCB-1254	27423000	<b>274000000</b>
PCB-1260	27423000	U

**Surrogate Standard Recovery**

2,4,5,6-Tetrachloro-m-xylene \* %  
Decachlorobiphenyl \* %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-2,1:100000,,A/C
Column ID: 0.25 mm	Data File: M32514.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 831351.3
Column ID: 0.25 mm	

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	272704411	273680500	0.4	

# Column to be used to flag RPD values greater than QC limit of 40%

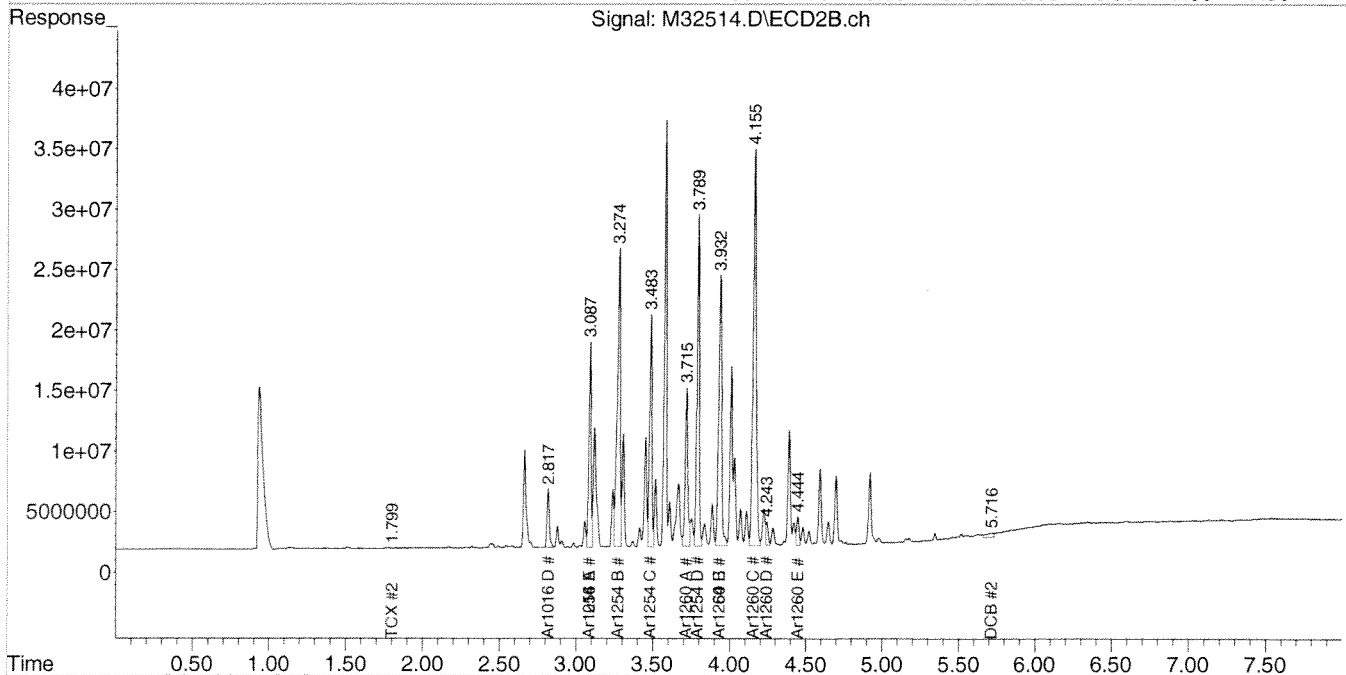
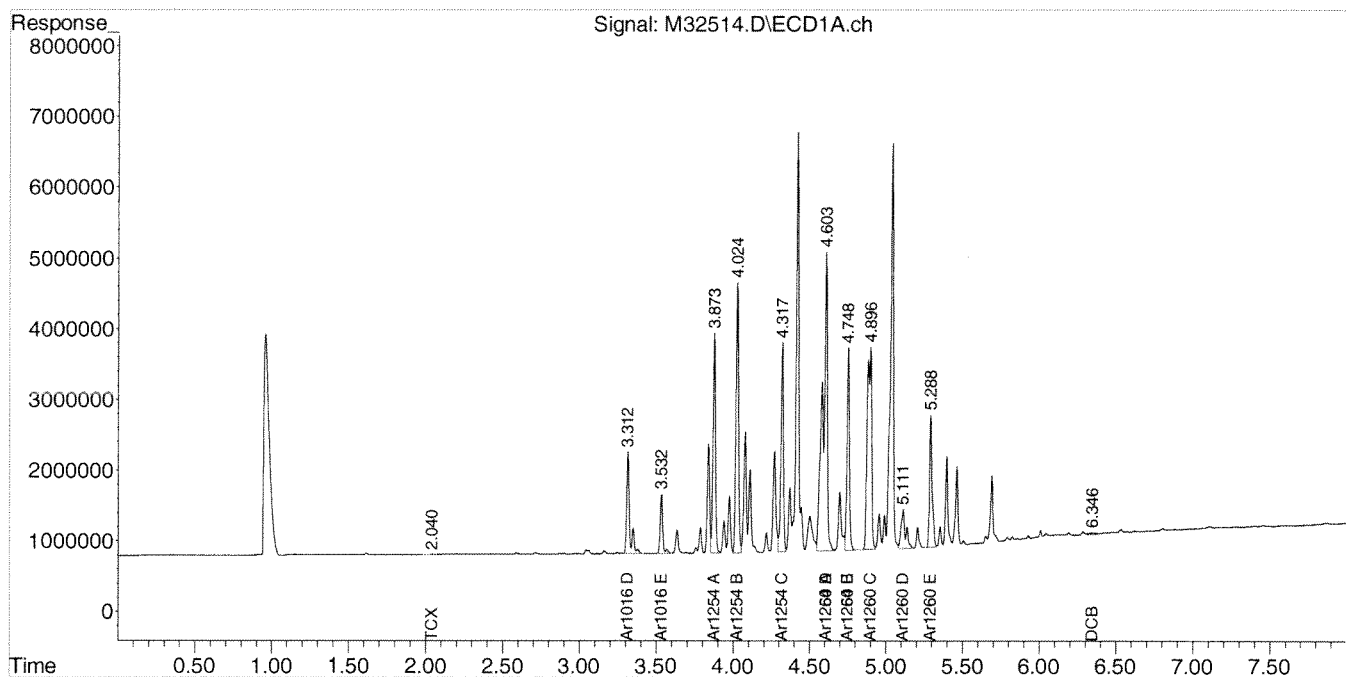
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32514.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 4:35 pm  
Operator : JK  
Sample : 68098-2,1:100000,,A/C  
Misc : SOIL  
ALS Vial : 17 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:07 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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**SAMPLE DATA**

**CLIENT SAMPLE ID**

---

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10183 KCL 110 int

**Lab Sample ID:** 68098-3  
**Matrix:** Solid  
**Percent Solid:** 100  
**Dilution Factor:** 465000  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit µg/kg	Results µg/kg
PCB-1016	15345000	U
PCB-1221	15345000	U
PCB-1232	15345000	U
PCB-1242	15345000	U
PCB-1248	15345000	U
PCB-1254	15345000	<b>227000000</b>
PCB-1260	15345000	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	* %	
Decachlorobiphenyl	* %	
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.





PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-3,1:50000,,A/C
Column ID: 0.25 mm	Data File: M32515.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 464495.8
Column ID: 0.25 mm	

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	200723034	227037464	12.3	

# Column to be used to flag RPD values greater than QC limit of 40%

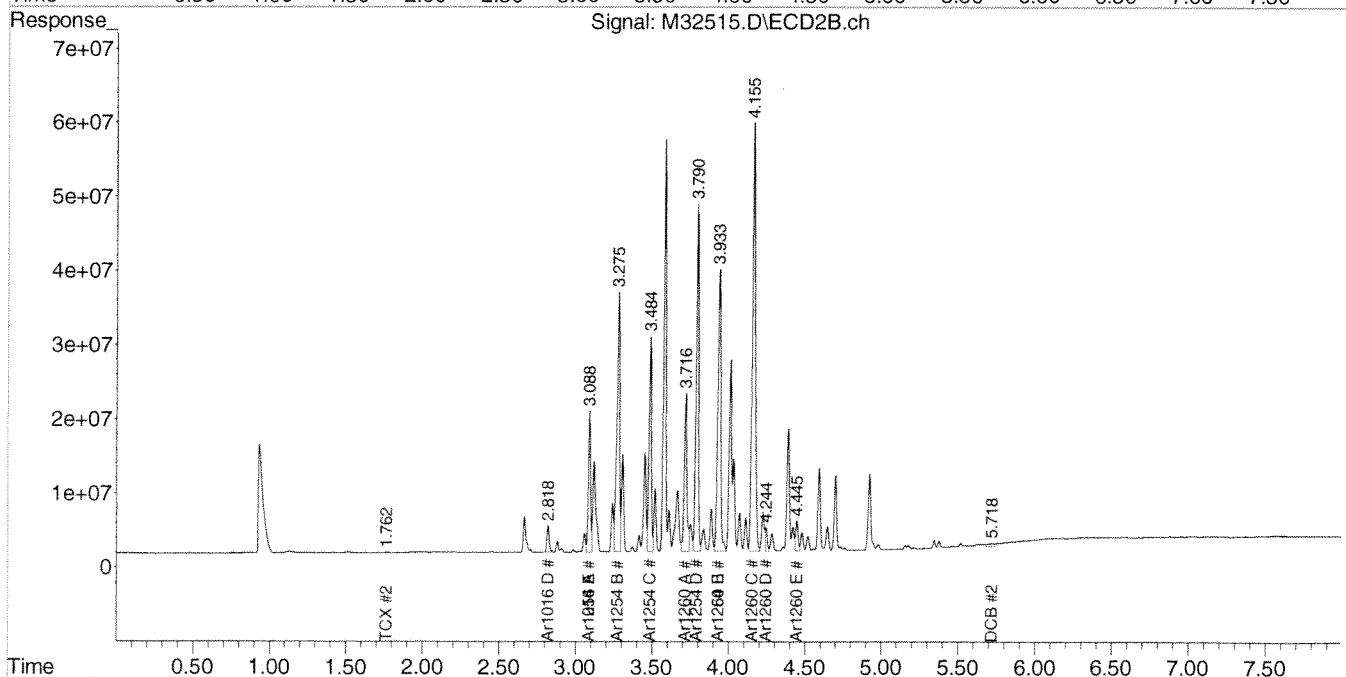
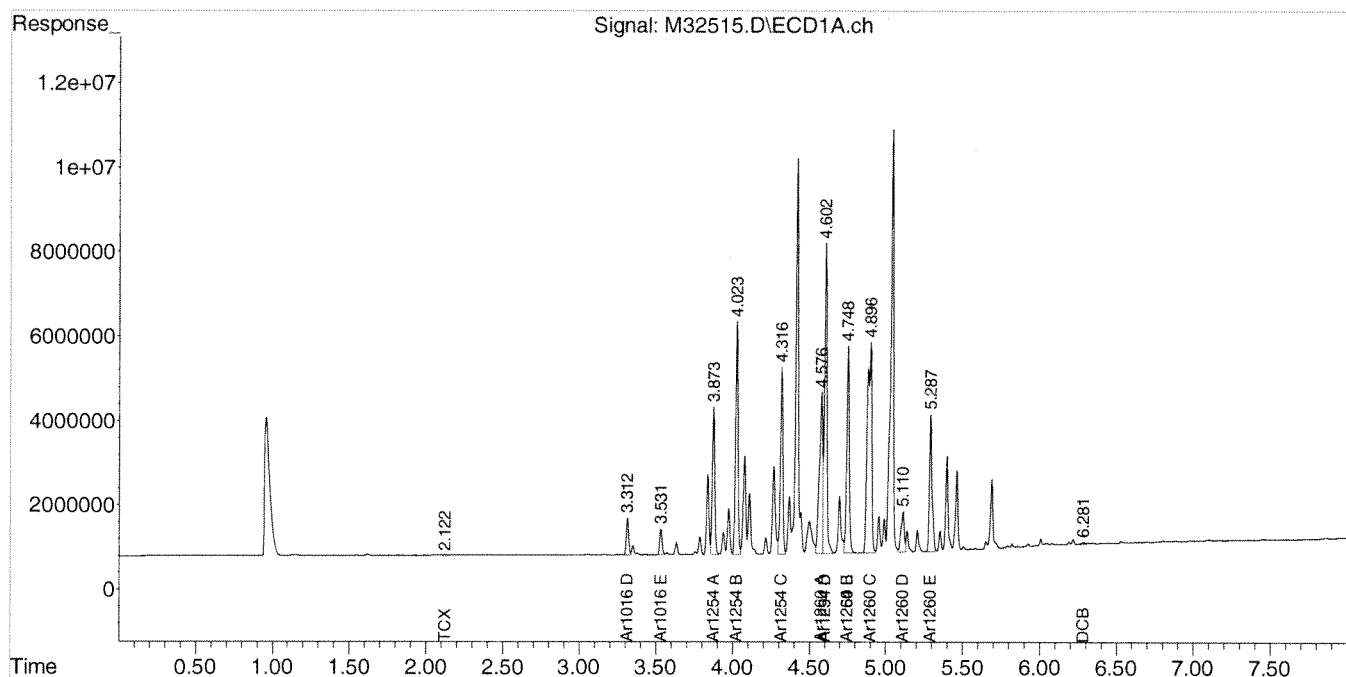
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32515.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 4:45 pm  
Operator : JK  
Sample : 68098-3,1:50000,,A/C  
Misc : SOIL  
ALS Vial : 18 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:09 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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November 1, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10184 KCL 114 ext

**Lab Sample ID:** 68098-4  
**Matrix:** Solid  
**Percent Solid:** 98  
**Dilution Factor:** 758000  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	25014000	U
PCB-1221	25014000	U
PCB-1232	25014000	U
PCB-1242	25014000	U
PCB-1248	25014000	U
PCB-1254	25014000	<b>294000000</b>
PCB-1260	25014000	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	* %	
Decachlorobiphenyl	* %	
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-4,1:100000,,A/C
Column ID: 0.25 mm	Data File: M32516.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 758403.1
Column ID: 0.25 mm	

Column #1		Column #2	
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD #
PCB 1254	256954329	293743174	13.4

# Column to be used to flag RPD values greater than QC limit of 40%

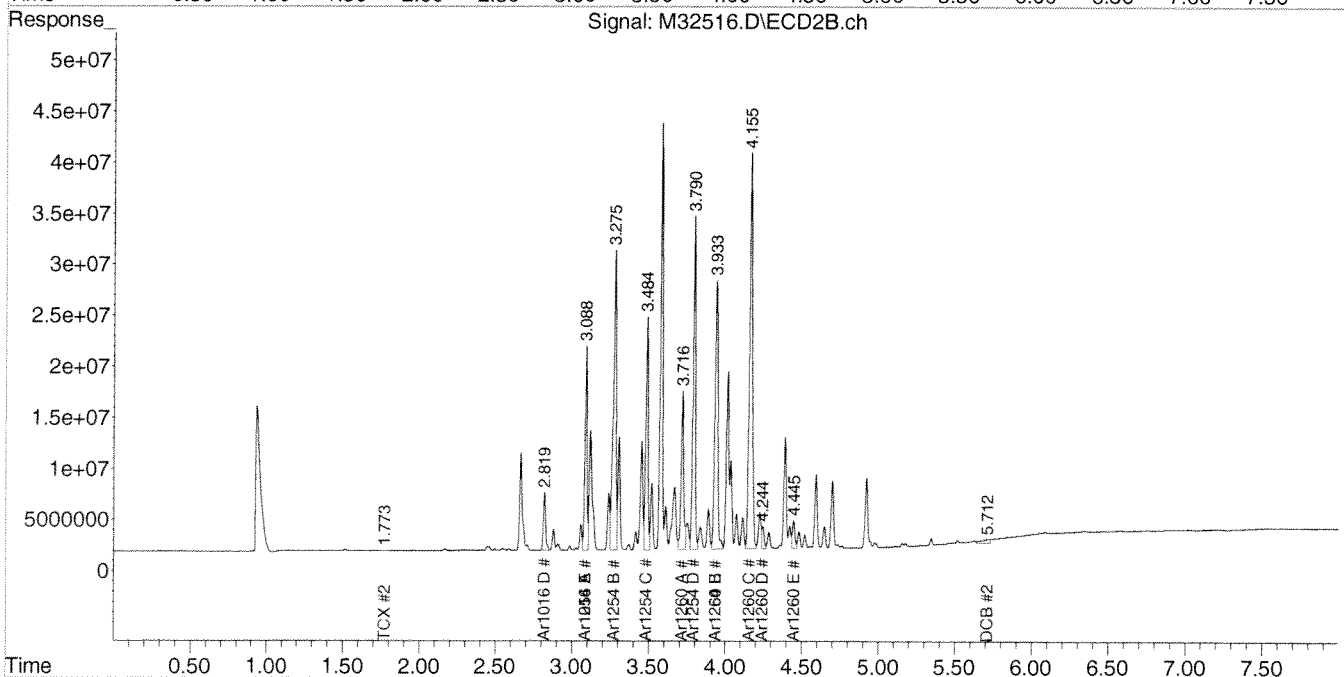
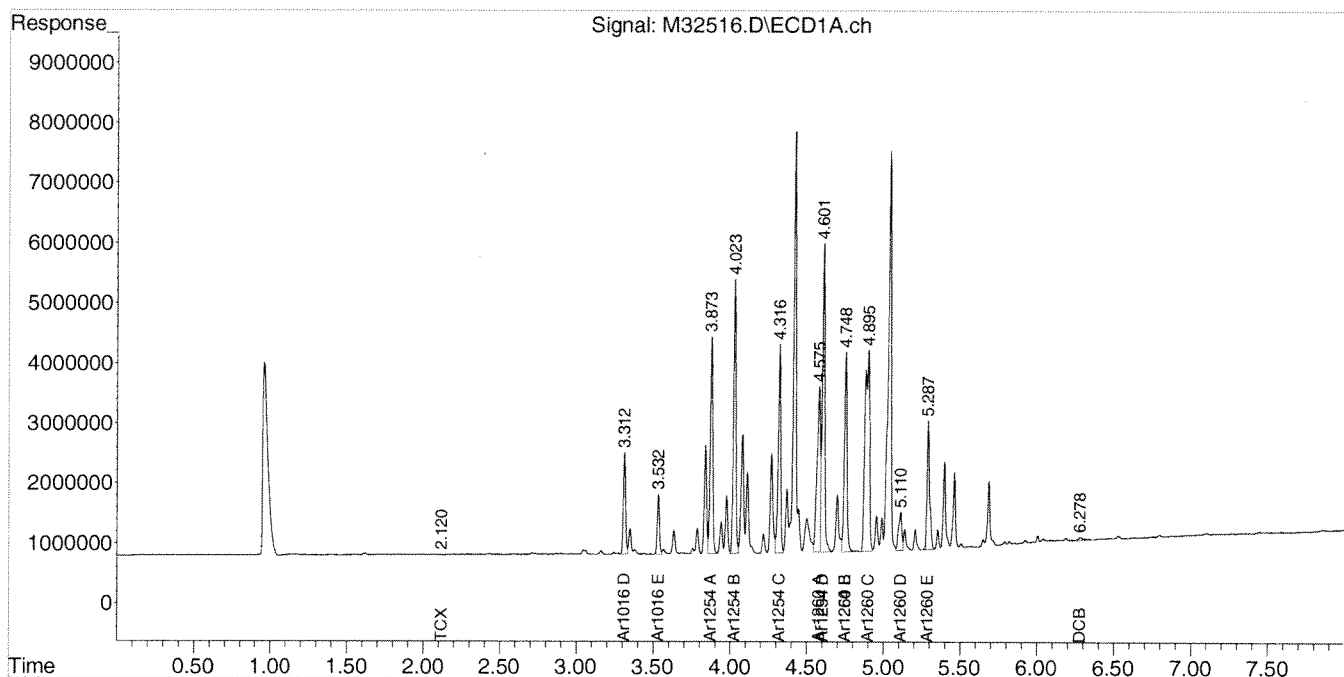
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32516.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 4:55 pm  
Operator : JK  
Sample : 68098-4,1:100000,,A/C  
Misc : SOIL  
ALS Vial : 19 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:11 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10185 KCL 110 ext

**Lab Sample ID:** 68098-5  
**Matrix:** Solid  
**Percent Solid:** 100  
**Dilution Factor:** 1.01e+6  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33330000	U
PCB-1221	33330000	U
PCB-1232	33330000	U
PCB-1242	33330000	U
PCB-1248	33330000	U
PCB-1254	33330000	<b>310000000</b>
PCB-1260	33330000	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	*	%
Decachlorobiphenyl	*	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-5,1:100000,,A/C
Column ID: 0.25 mm	Data File: M32517.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 1010101.0
Column ID: 0.25 mm	

Column #1		Column #2	
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD #
PCB 1254	271147980	310016768	13.4

# Column to be used to flag RPD values greater than QC limit of 40%

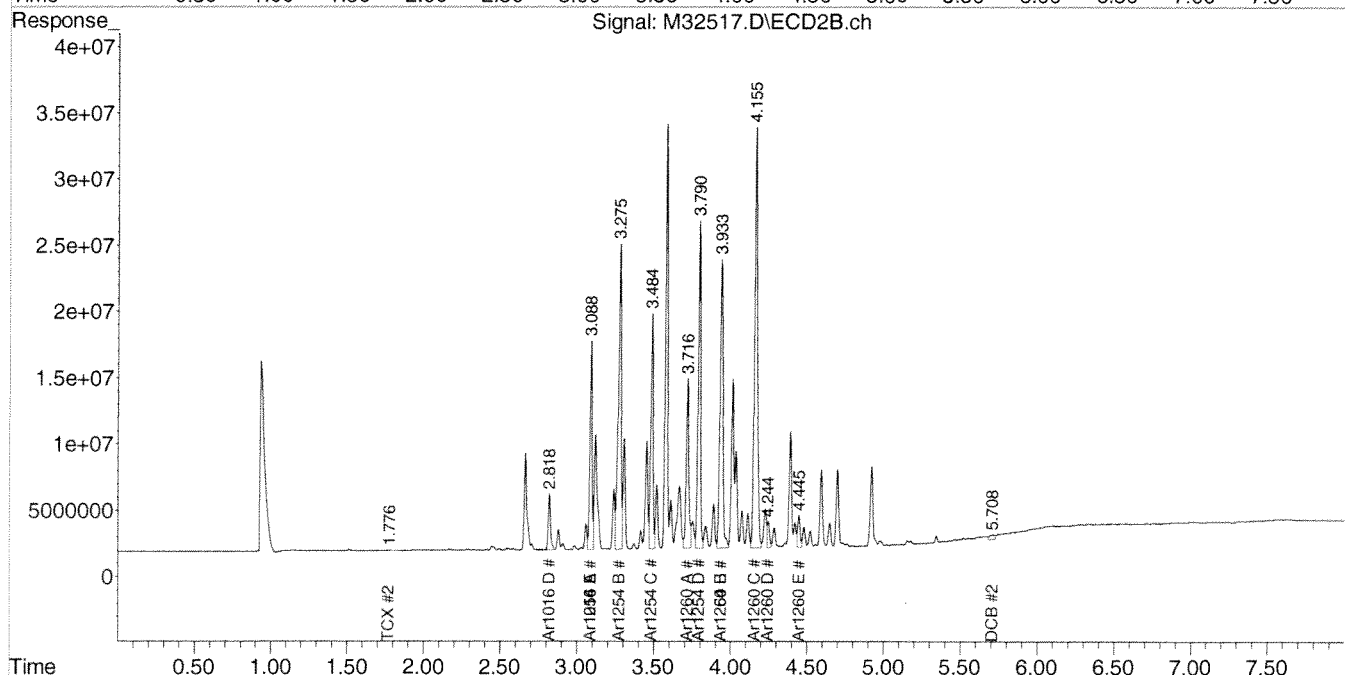
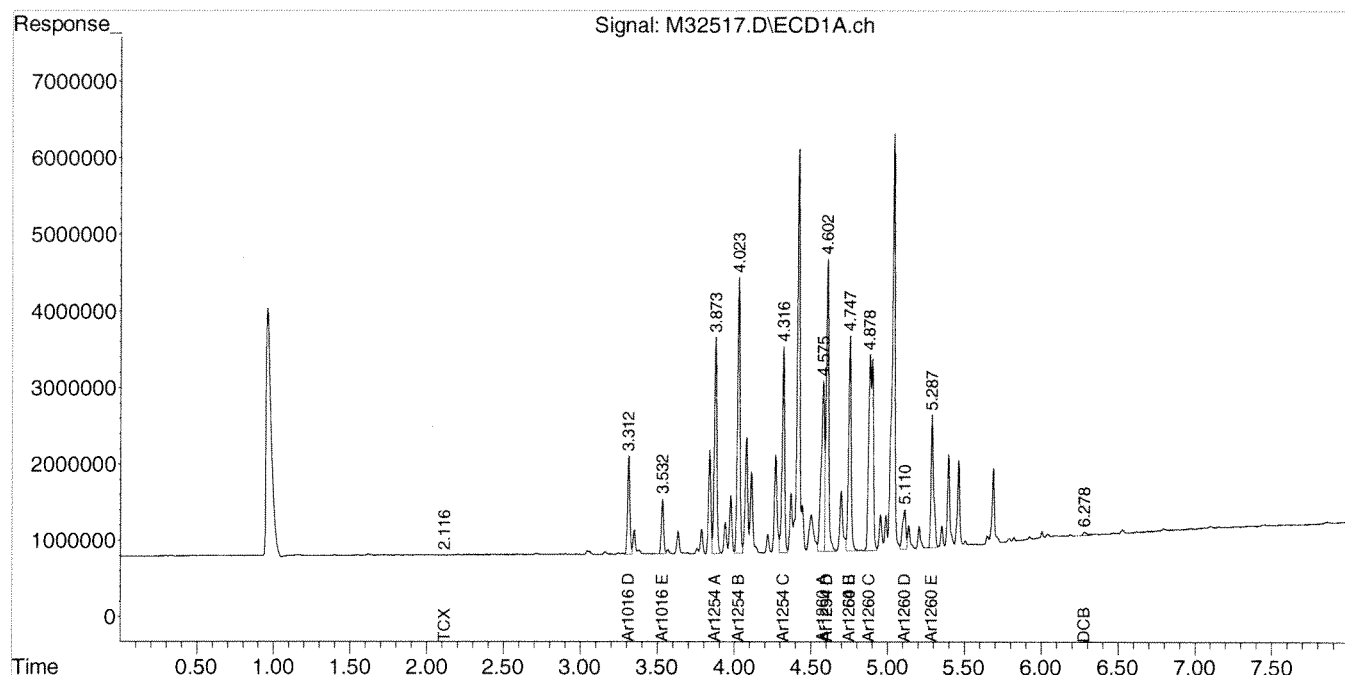
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32517.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 5:06 pm  
Operator : JK  
Sample : 68098-5,1:100000,,A/C  
Misc : SOIL  
ALS Vial : 20 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:13 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um





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November 1, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10187 KCLext glaz

**Lab Sample ID:** 68098-6  
**Matrix:** Solid  
**Percent Solid:** 100  
**Dilution Factor:** 3330  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	110000	U
PCB-1221	110000	U
PCB-1232	110000	U
PCB-1242	110000	U
PCB-1248	110000	U
PCB-1254	110000	<b>2680000</b>
PCB-1260	110000	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	* %	
Decachlorobiphenyl	* %	
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-6,1:500,,A/C
Column ID: 0.25 mm	Data File: M32511.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 3333.3
Column ID: 0.25 mm	

Column #1		Column #2	
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD #
PCB 1254	2395113	2678407	11.2

# Column to be used to flag RPD values greater than QC limit of 40%

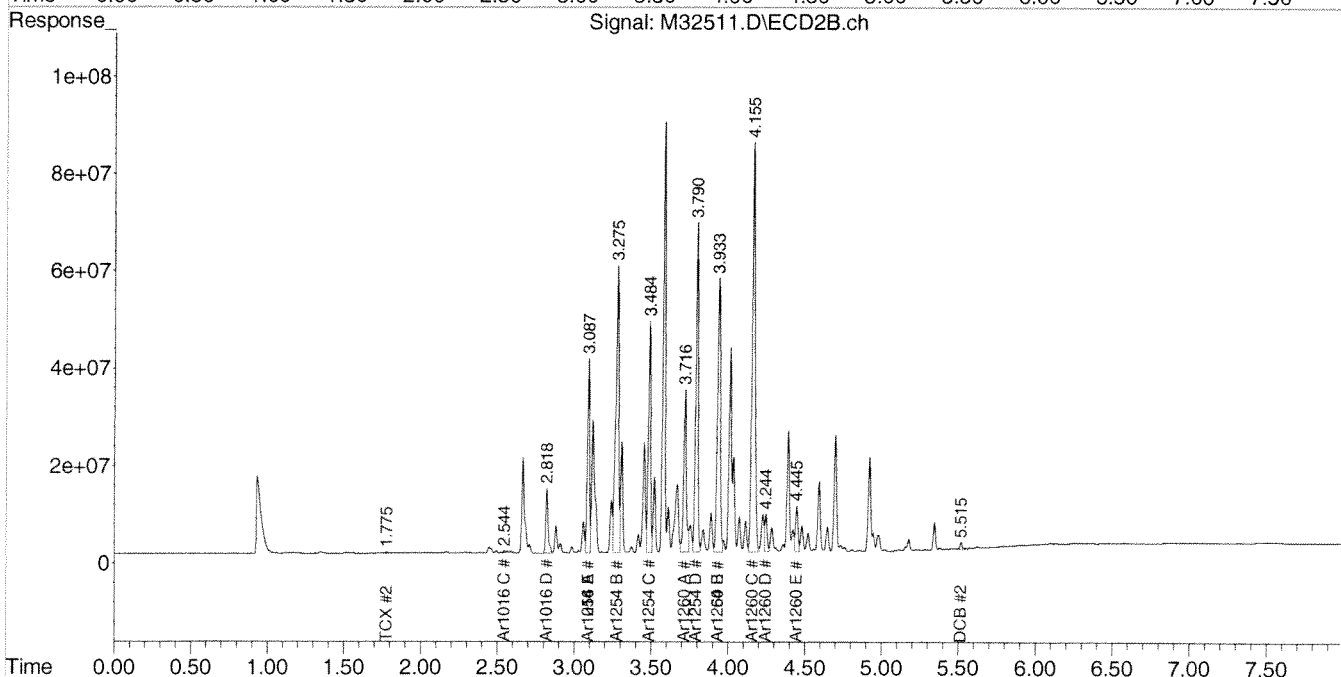
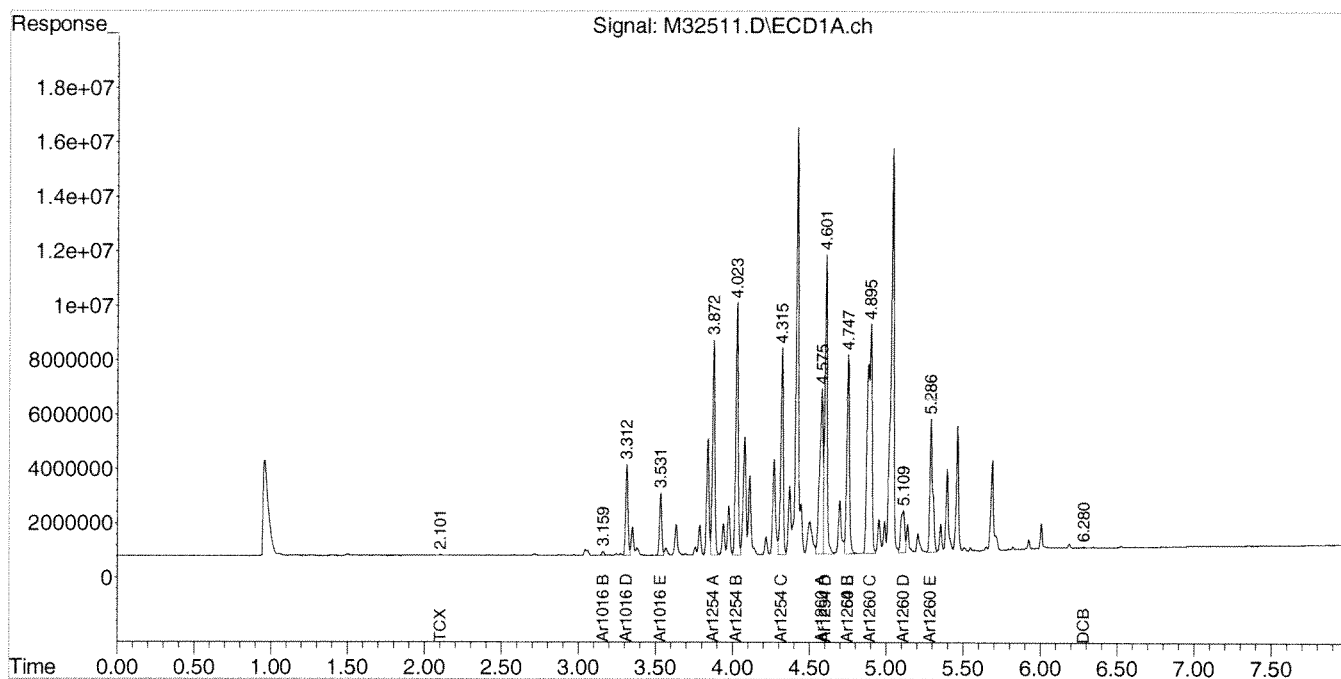
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32511.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 3:53 pm  
Operator : JK  
Sample : 68098-6,1:500,,A/C  
Misc : SOIL  
ALS Vial : 14 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:01 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL Mock Up  
**Project Number:** 102010  
**Field Sample ID:** 10186 KCL 110 ext

**Lab Sample ID:** 68098-7  
**Matrix:** Solid  
**Percent Solid:** 100  
**Dilution Factor:** 424000  
**Collection Date:** 10/18/10  
**Lab Receipt Date:** 10/21/10  
**Extraction Date:** 10/25/10  
**Analysis Date:** 10/29/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	13992000	U
PCB-1221	13992000	U
PCB-1232	13992000	U
PCB-1242	13992000	U
PCB-1248	13992000	U
PCB-1254	13992000	<b>213000000</b>
PCB-1260	13992000	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	*	%
Decachlorobiphenyl	*	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68098
GC Column #1: STX-CLPesticides I	Sample: 68098-7,1:50000,,A/C
Column ID: 0.25 mm	Data File: M32518.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 423728.8
Column ID: 0.25 mm	

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	187119788	213298602	13.1	

# Column to be used to flag RPD values greater than QC limit of 40%

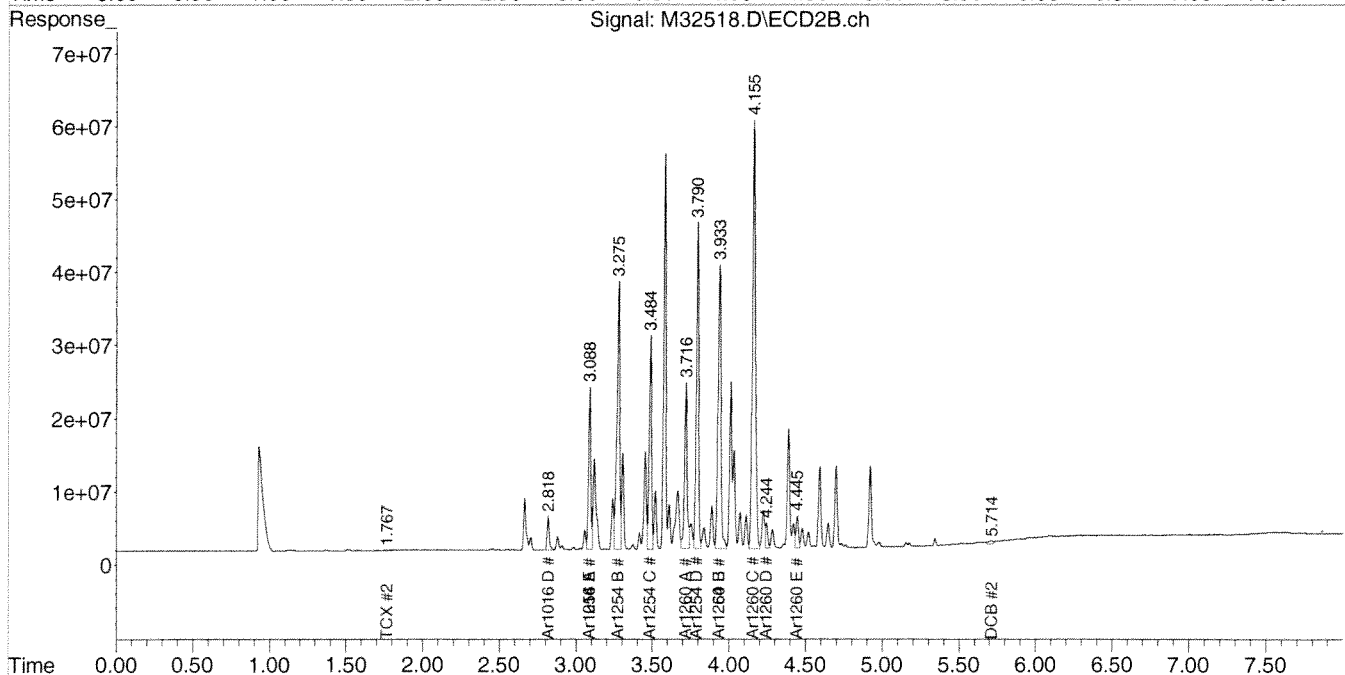
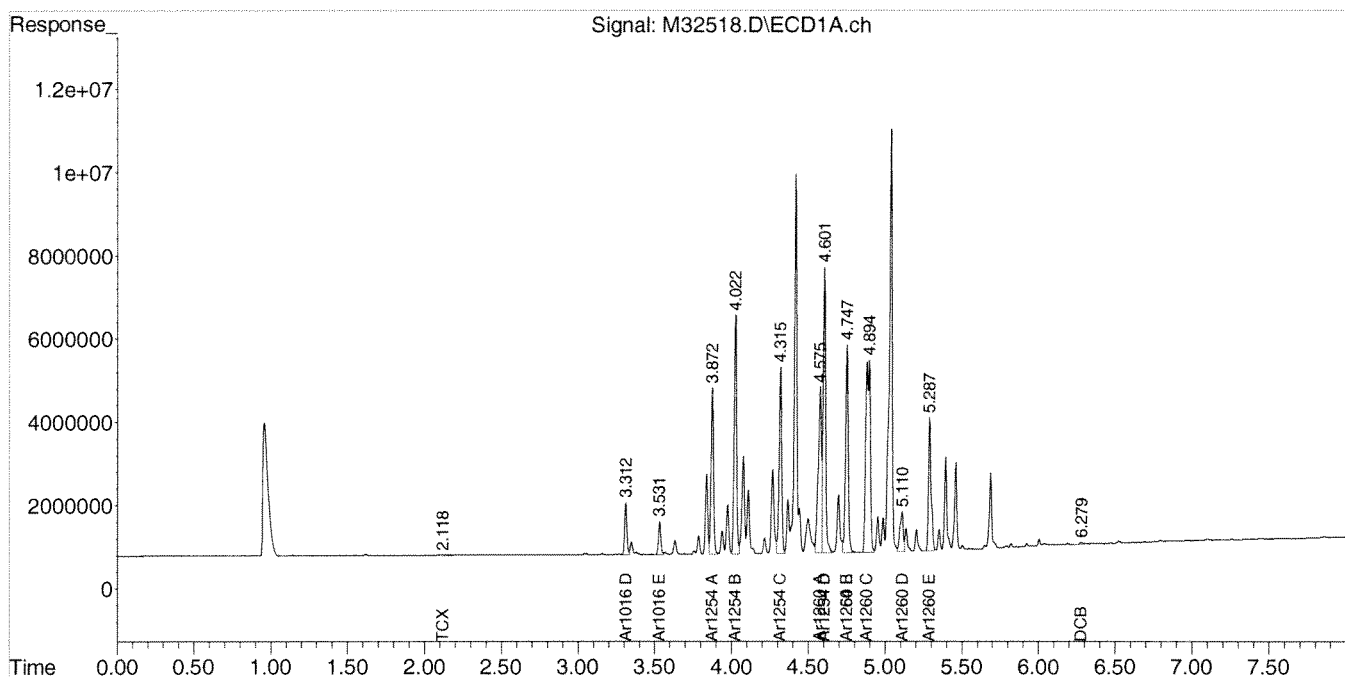
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\102910-M\  
Data File : M32518.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 29 Oct 2010 5:16 pm  
Operator : JK  
Sample : 68098-7,1:50000,,A/C  
Misc : SOIL  
ALS Vial : 21 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 01 10:17:15 2010  
Quant Method : C:\msdchem\1\METHODS\PCB100910.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Tue Oct 12 11:50:46 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



PCB  
QC FORMS

# PCB SOIL SYSTEM MONITORING COMPOUNDS SUMMARY

Instrument ID: M  
GC Column #1: STX-CLPesticides I  
Column ID: 0.25 mm  
GC Column #2: STX-CLPesticides II  
Column ID: 0.25 mm

SDG: 68098

[illegible]

	Lower Limit	Upper Limit
SMC #1 = TCX	40	130
SMC #2 = DCB	40	130

# Column to be used to flag recovery values outside of QC limits  
\* Values outside QC limits  
D System Monitoring Compound diluted out



PCB SOIL  
LABORATORY CONTROL SAMPLE/DUPLICATE  
PERCENT RECOVERY

Instrument ID: M

GC Column #1: STX-CLPesticides I

Column ID: 0.25 mm

GC Column #2: STX-CLPesticides II

Column ID: 0.25 mm

SDG: 68098

Non-spiked sample: B102510PSOX,RR,,A/C

Spike: L102510PSOX,RR,,A/C

Spike duplicate: LD102510PSOX,RR,,A/C

COMPOUND	LCS SPIKE ADDED (ug/kg)	LCSD SPIKE ADDED (ug/kg)	LOWER LIMIT	UPPER LIMIT	RPD LIMIT	NON-SPIKE RESULT (ug/kg)	SPIKE RESULT (ug/kg)	SPIKE % REC	SPIKE #	SPIKE DUP RESULT (ug/kg)	SPIKE DUP % REC	SPIKE DUP #	RPD	#
PCB 1016	200	200	65	140	30	0	237	118		245	122		3.2	
PCB 1260	200	200	60	130	30	0	240	120		259	130		7.5	
PCB 1016 #2	200	200	65	140	30	0	259	130		265	132		2.0	
PCB 1260 #2	200	200	60	130	30	0	256	128		259	130		1.1	

# Column to be used to flag recovery and RPD values outside of QC limits

\* Values outside QC limits


LCS/LCSD spike added values have been weight adjusted.

Non-spike result of "0" used in place of "U" to allow calculation of spike recovery.

Comments: \_\_\_\_\_  
\_\_\_\_\_

## CHAIN OF CUSTODIES

# Chain Of Custody Form

		195 Commerce Way Suite E Portsmouth, NH 03801 Phone (603) 436-5111 Fax (603) 430-2151		<b>For Analytics Use Only</b> Rev. 4 03/28/08	
Project#: 102010 Proj. Name: KCL Mock up Company: Yale EHS Contact: Steve Murdzia/Rob Klein Address: 135 College St, Ste 100 New Haven, CT 06510 Phone: 203-737-4453 PO# Quote # Sampler (Signature):	Matrix Key: C = Concrete WP = Wipe WW = Wastewater SW = Surface Water GW = Groundwater DW = Drinking Water S = Soil/Sludge O = Oil E = Extract X = Other	Samples were: 1) Shipped or hand-delivered 2) Temp blank °C 19.3° 3) Received in good condition Y or N 4) pH checked by: NA 5) Labels checked by: 88 10/21/10		Received By: Fed Ex Date: 10/21/10 Time: 8:00	Received By: Fed Ex Date: 10/21/10 Time: 8:00
Station Identification		Sample Date	Sample Time	Analysis	pH Analytics Sample #
10181 KCL 114 int	18-Oct NA	NA	PCB in caulk		68098 - 1
10182 KCL 110 int	18-Oct NA	NA	EPA method 8082		2
10183 KCL 110 int	18-Oct NA	NA	3540C Soxhlet extract		3
10184 KCL 114 ext	18-Oct NA	NA			4
10185 KCL 110 ext	18-Oct NA	NA			5
10186 KCL ext glaz	18-Oct NA	NA			6
10186 KCL 110 ext	18-Oct NA	NA			7
Email Results to: rob.klein@yale.edu		Comments / Instructions: Sample "10186 KCL 110 Ext" is not listed on COC but present in shipment log sample in and add to COC quotation - as per Steve M. YAL 9/10/10 - CP 10/21/10 Sample name changed as per Steve M. @ Yale - CP 10/21/10			
Turnaround Request Standard <input checked="" type="checkbox"/> Priority <input type="checkbox"/> Due Date Due Date		Project Requirements: Report Type: <input checked="" type="checkbox"/> MCP <input type="checkbox"/> CTRC <input type="checkbox"/> DOD <input type="checkbox"/> Standard State: <input type="checkbox"/> NH <input type="checkbox"/> MA <input type="checkbox"/> ME <input type="checkbox"/> CT <input type="checkbox"/> RI State Standard: (eg. S-1 or GW-1) EDD Required: Y* Type:			
Lab Approval Required		Relinquished By: Fed Ex Date: 10/21/10 Time: 8:00			

## ANALYTICS SAMPLE RECEIPT CHECKLIST



AEL LAB#: 68098 COOLER NUMBER: N/A  
 CLIENT: Yale NUMBER OF COOLERS: N/A  
 PROJECT: KCL Mock UP DATE RECEIVED: 10/21/10

## A: PRELIMINARY EXAMINATION:

DATE COOLER OPENED: 10/21/101. Cooler received by(initials): CPDate Received: 10/21/102. Circle one: Hand delivered  
(If so, skip 3)Shipped

3. Did cooler come with a shipping slip?

Y

N

3a. Enter carrier name and airbill number here:

Fed Ex 7963 6288 9443

4. Were custody seals on the outside of cooler?

Y

N

How many &amp; where: \_\_\_\_\_

Seal Date: \_\_\_\_\_

Seal Name: \_\_\_\_\_

5. Did the custody seals arrive unbroken and intact upon arrival?

Y

N/A6. COC#: N/A

7. Were Custody papers filled out properly (ink, signed, etc)?

Y

N

8. Were custody papers sealed in a plastic bag?

Y

N

9. Did you sign the COC in the appropriate place?

Y

N

10. Was the project identifiable from the COC papers?

Y

N

11. Was enough ice used to chill the cooler?

Y

N

Temp. of cooler:

19.3°

## B. Log-In: Date samples were logged in:

10/21/10

By:

CP

12. Type of packing in cooler(bubble wrap, popcorn)

Y

N

13. Were all bottles sealed in separate plastic bags?

Y

N

14. Did all bottles arrive unbroken and were labels in good condition?

Y

N

15. Were all bottle labels complete(ID, Date, time, etc.)

Y

N

16. Did all bottle labels agree with custody papers?

Y

N

17. Were the correct containers used for the tests indicated:

Y

N

18. Were samples received at the correct pH?

Y

N/A

19. Was sufficient amount of sample sent for the tests indicated?

Y

N

20. Were bubbles absent in VOA samples?

Y

N/A

If NO, List Sample ID's and Lab #'s: \_\_\_\_\_

21. Laboratory labeling verified by (initials):

JSB

Date:

10/21/10

10-21-2010 09:54

From=ANALYTICS

T-461 P.001/004 F-880



**SAMPLE RECEIPT  
NON-COMPLIANCE NOTIFICATION  
(SENT VIA FACSIMILE)**

DATE 10/21/10FROM CaseyFAX CONTACT Steve Mordziah/Rob KleinFAX NUMBER 203-785-7588CLIENT Vale EHSLAB NUMBER 68098

The exceptions noted below were found on the sample(s) received on the attached Chain of Custody (COC) form. These exceptions may render the data results as non-defensible. Analytics will continue to proceed with the analysis of the sample(s) unless notified in writing to stop the analysis. This document may become part of the final report.

Please check the appropriate box and sign below and fax back to "Sample Receipt" at 603-430-2151.

**Exceptions:**

- ☒ Sample(s) not on ice or not at  $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$  - Samples @  $19.3^{\circ}$
- ☐ Sample(s) received unpreserved or not at the proper pH.  
(pH was adjusted at the laboratory)
- ☒ Sample(s) received in incorrect containers - PCB caulking should be in 4oz jar glass
- ☐ Insufficient sample volume received  
(Detection limits may be elevated due to this exception)
- ☐ Trip Blank provided in cooler, but not recorded on the chain of custody
- ☒ Other: Sample "10186 KCL 110 Ext" is not listed on COC but present in shipment

**Acknowledgment:**

- ☐ Please do not analyze/report Trip Blank, proceed with other analyses
- ☒ Proceed with the analysis.
- ☐ Please stop the analysis and wait for further instructions.

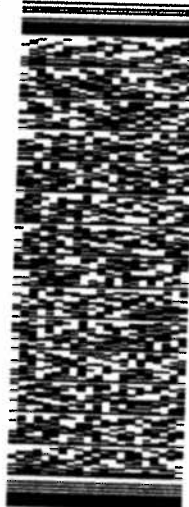
Signed: [Signature]Print Name: STEVEN MORDZIAHDate: 10/22/10

From: Origin ID: EFBA (203) 785-3550  
 Marilyn Mesner  
 Yale University  
 135 College St  
 New Haven, CT 06510



SHIP TO: (603) 438-5111 BILL SENDER

**Analytics Environmental Laboratory**  
**185 Commerce Way Suite E**  
**Portsmouth, NH 03801**



Ship Date: 20OCT10  
 ActWgt: 0.5 LB  
 CAD: 6271659/WBUS0200

Delivery Address Bar Code

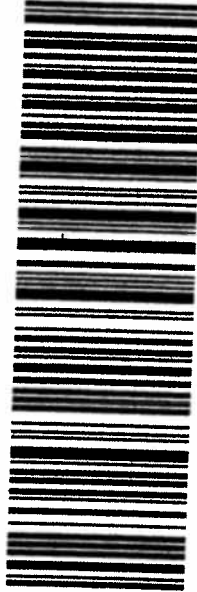


Ref # KCL  
 Invoice #  
 PO #  
 Dept #

TRK# 7963 6288 9443  
 THU - 21 OCT A2  
 FIRST OVERNIGHT  
 DSR

**X1 IGGA**

03801  
 NH-US  
 MHT



**FedEx First Overnight**

147918 REV 8/08 RHO

December 2, 2010

Mr. Rob Klein  
Yale University Environmental Health & Safety  
135 College Street  
New Haven CT 06510

**RE: Analytical Results Case Narrative  
Analytics # 68444**

Dear Mr. Klein;

Enclosed please find the analytical results for samples submitted for the above-mentioned project. The attached Cover Page lists the sample IDs, Lab tracking numbers and collection dates for the samples included in this deliverable.

Samples were analyzed Polychlorinated Biphenyls (PCBs) by EPA Method 8082.

Unless otherwise noted in the Non-conformance Summary listed below, all of the quality control (QC) criteria including initial calibration, calibration verification, surrogate recovery, holding time and method accuracy/precision for these analyses were within acceptable limits.

This Level II data package has been assembled in the following order:

- Case Narrative/Non-Conformance Summary
- Sample Log Sheet - Cover Page
- PCB Form 1 Data Sheet for Samples and Blanks
- Chromatograms
- PCB Form 10 Confirmation Results
- PCB Form 3 MS/MSD (LCS) Recoveries
- Chain of Custody (COC) Forms

## QC NON-CONFORMANCE SUMMARY

### Sample Receipt:

The cooler temperature upon receipt was 8.2<sup>0</sup> C upon receipt at the laboratory. The client was contacted and instructed the laboratory to proceed with analysis.

### PCBs by EPA Method 8082:

Samples 68444-1, 68444-2, 68444-4, 68444-7 and 68444-8 required dilution due to concentrations of PCBs that exceeded the calibration range of the instrument.

Sincerely,  
ANALYTICS Environmental Laboratory, LLC



Stephen Knollmeyer  
Laboratory Director



Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

**Report Number: 68444**

**Revision: Rev. 0**

**Re:**

Enclosed are the results of the analyses on your sample(s). Samples were received on 23 November 2010 and analyzed for the tests listed. Samples were received in acceptable condition, with the exceptions noted below or on the chain of custody. These results pertain to samples as received by the laboratory and for the analytical tests requested on the chain of custody. The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. Please see individual reports for specific methodologies and references.

<u>Lab Number</u>	<u>Sample Date</u>	<u>Station Location</u>	<u>Analysis</u>	<u>Comments</u>
68444-1	10/16/10	1116-1 KCL	EPA 8082 (PCBs only)	
68444-2	10/16/10	1116-2 KCL	EPA 8082 (PCBs only)	
68444-3	10/17/10	1117-1 KCL	EPA 8082 (PCBs only)	
68444-4	10/17/10	1117-2 KCL	EPA 8082 (PCBs only)	
68444-5	10/17/10	1117-3 KCL	EPA 8082 (PCBs only)	
68444-6	10/17/10	1117-4 KCL	EPA 8082 (PCBs only)	
68444-7	10/17/10	1117-5 KCL	EPA 8082 (PCBs only)	
68444-8	10/17/10	1117-6 KCL	EPA 8082 (PCBs only)	

**Sample Receipt Exceptions:** None

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Virginia, Maryland, and is accredited by the Department of Defense (DOD) ELAP program. A list of actual certified parameters is available upon request.

If you have any questions on these results, please do not hesitate to contact us.

Authorized signature

  
Stephen L. Knollmeyer Lab. Director

Date

12/3/2010

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consent of Analytics Environmental Laboratory, LLC.**

### Surrogate Compound Limits

	Matrix: Units:	Aqueous % Recovery	Solid % Recovery	Method
<b>Volatile Organic Compounds - Drinking Water</b>				
1,4-Difluorobenzene		70-130		EPA 524.2
Bromofluorobenzene		70-130		
1,2-Dichlorobenzene-d4		70-130		
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane-d4		70-120	70-120	EPA 624/8260B
Toluene-d8		85-120	85-120	
Bromofluorobenzene		75-120	75-120	
<b>Semi-Volatile Organic Compounds</b>				
2-Fluorophenol		20-110	35-105	EPA 625/8270C
d5-Phenol		15-110	40-100	
d5-nitrobenzene		40-110	35-100	
2-Fluorobiphenyl		50-110	45-105	
2,4,6-Tribromophenol		40-110	40-125	
d14-p-terphenyl		50-130	30-125	
<b>PAH's by SIM</b>				
d5-nitrobenzene		21-110	35-110	EPA 8270C
2-Fluorobiphenyl		36-121	45-105	
d14-p-terphenyl		33-141	30-125	
<b>Pesticides and PCBs</b>				
2,4,5,6-Tetrachloro-m-xylene (TCX)		46-122	40-130	EPA 608/8082
Decachlorobiphenyl (DCB)		40-135	40-130	
<b>Herbicides</b>				
Dichloroacetic acid (DCAA)		30-150	30-150	
<b>Gasoline Range Organics/TPH Gasoline</b>				
Trifluorotoluene TFT (FID)		60-140	60-140	MEDEP 4217/EPA 8015
Bromofluorobenzene (BFB) (FID)		60-140	60-140	
Trifluorotoluene TFT (PID)		60-140	60-140	
Bromofluorobenzene (BFB) (PID)		60-140	60-140	
<b>Diesel Range Organics/TPH Diesel</b>				
m-terphenyl		60-140	60-140	MEDEP 4125/EPA 8015/CT ETPH
<b>Volatile Petroleum Hydrocarbons</b>				
2,5-Dibromotoluene (PID)		70-130	70-130	MADEP VPH May 2004 Rev1.1
2,5-Dibromotoluene (FID)		70-130	70-130	
<b>Extracatable Petroleum Hydrocarbons</b>				
1-chloro-octadecane (aliphatic)		40-140	40-140	MADEP EPH May 2004 Rev1.1
o-Terphenyl (aromatic)		40-140	40-140	
2-Fluorobiphenyl (Fractionation)		40-140	40-140	
2-Bromonaphthalene (fractionation)		40-140	40-140	

## PCB DATA SUMMARIES

Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** Lab QC

**Lab Sample ID:** B112310PSOX

**Matrix:** Soil

**Percent Solid:** N/A

**Dilution Factor:** 1.0

**Collection Date:**

**Lab Receipt Date:**

**Extraction Date:** 11/23/10

**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	U
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	88	%
Decachlorobiphenyl	64	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

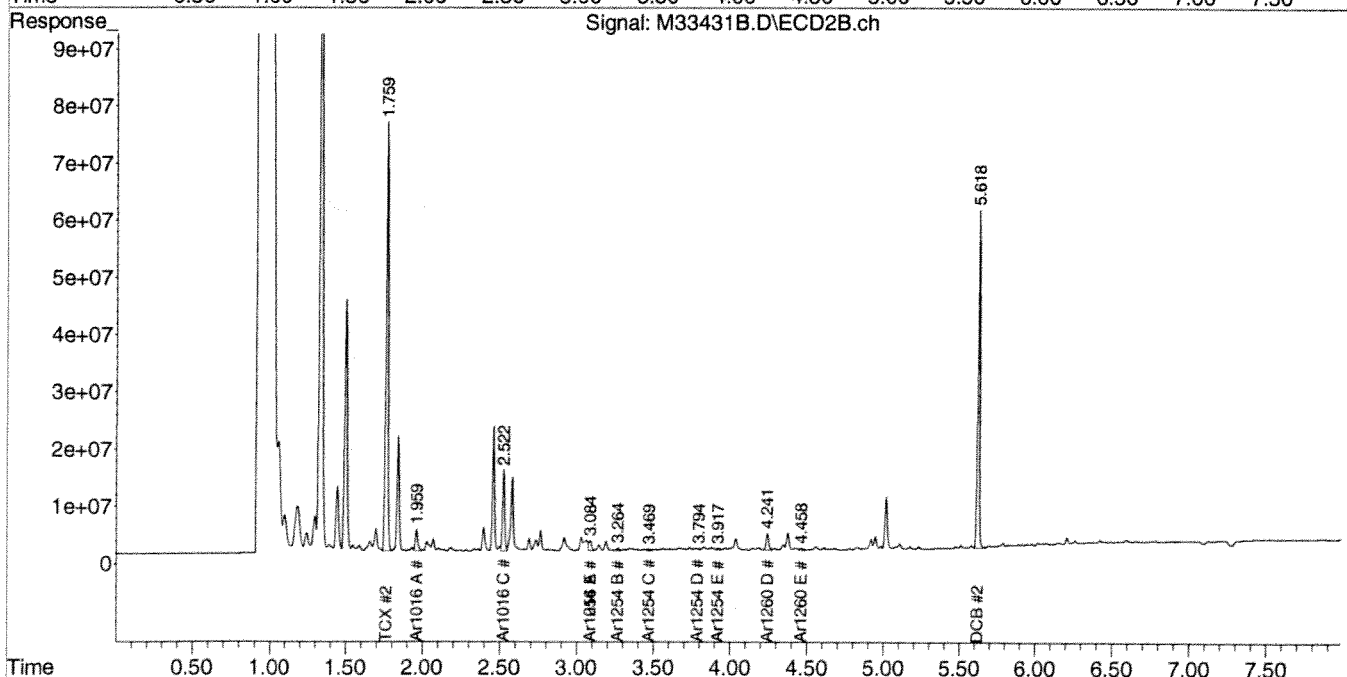
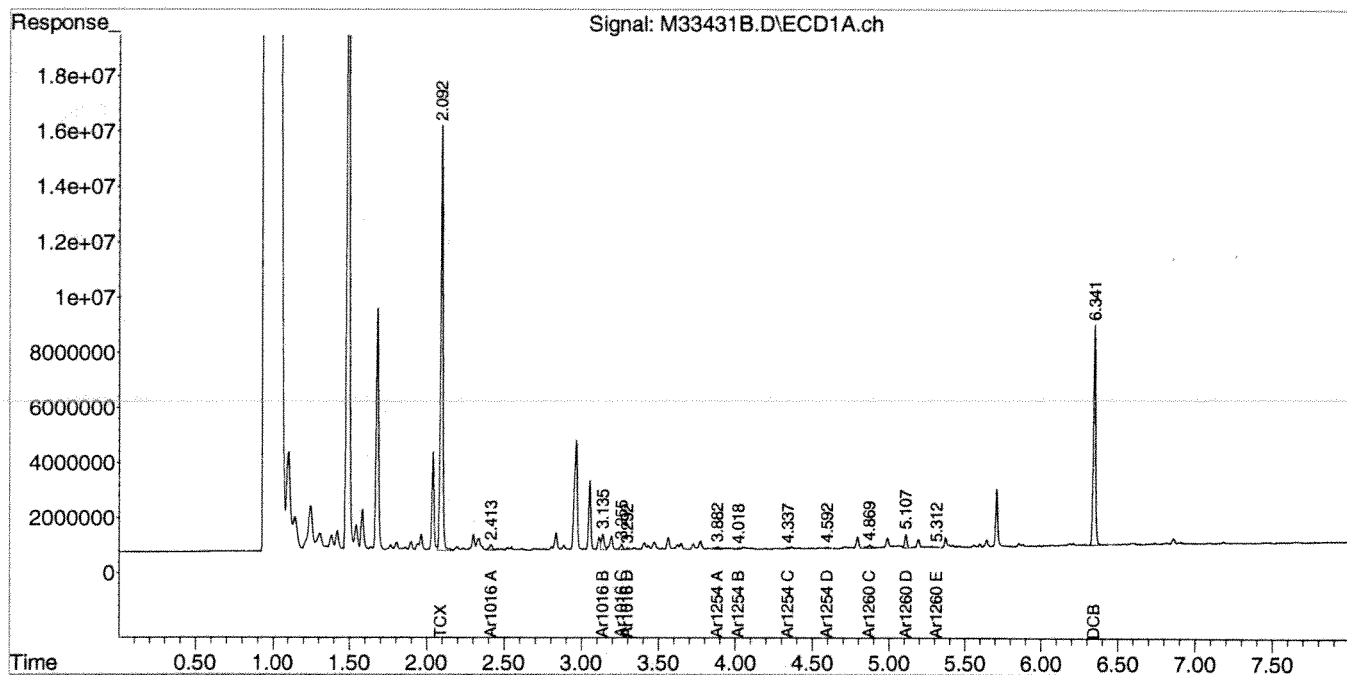
COMMENTS: Results are expressed on a dry weight basis.



Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33431B.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 11:50 am  
Operator : JK  
Sample : B112310PSOX,,A/C  
Misc : SOIL  
ALS Vial : 6 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:29 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1116-1 KCL

**Lab Sample ID:** 68444-1  
**Matrix:** Solid  
**Percent Solid:** 100  
**Dilution Factor:** 20  
**Collection Date:** 10/16/10  
**Lab Receipt Date:** 11/23/10  
**Extraction Date:** 11/23/10  
**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	660	U
PCB-1221	660	U
PCB-1232	660	U
PCB-1242	660	U
PCB-1248	660	U
PCB-1254	660	<b>10500</b>
PCB-1260	660	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	*	%
Decachlorobiphenyl	*	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68444
GC Column #1: STX-CLPesticides I	Sample: 68444-1,1:20,,A/C
Column ID: 0.25 mm	Data File: M33442.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 20.0
Column ID: 0.25 mm	

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	10533	10485	0.5	

# Column to be used to flag RPD values greater than QC limit of 40%

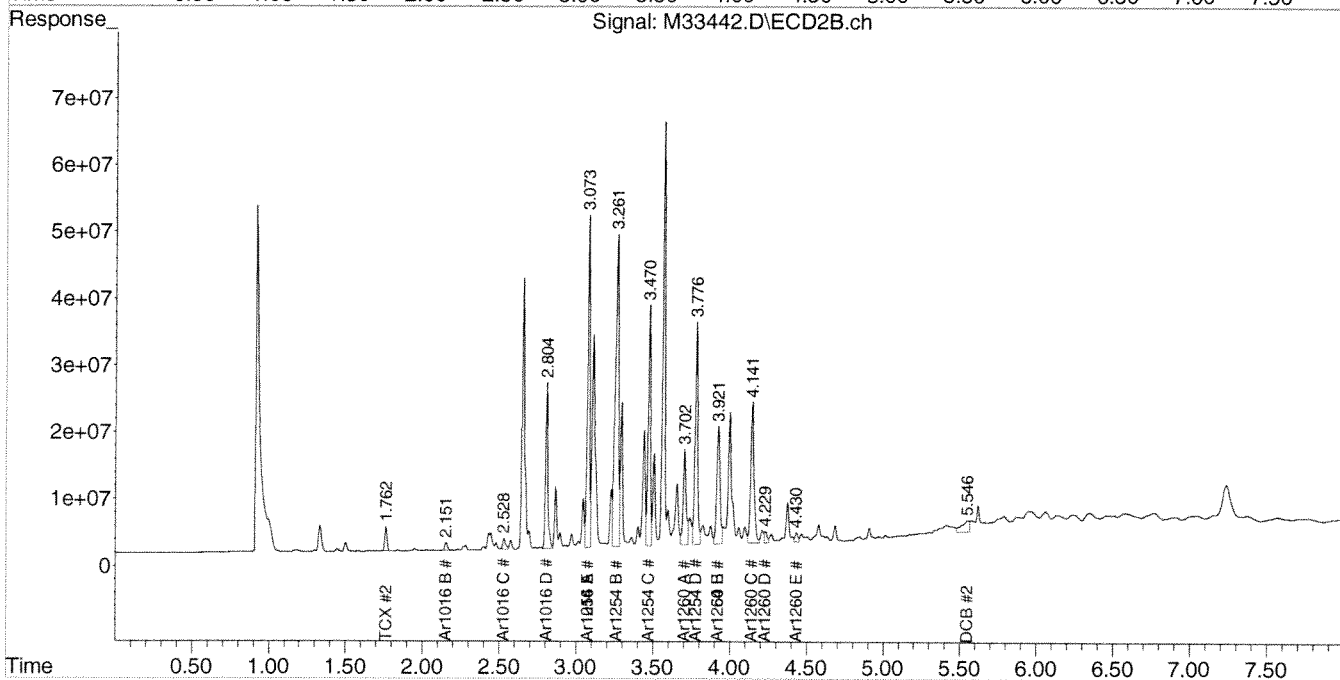
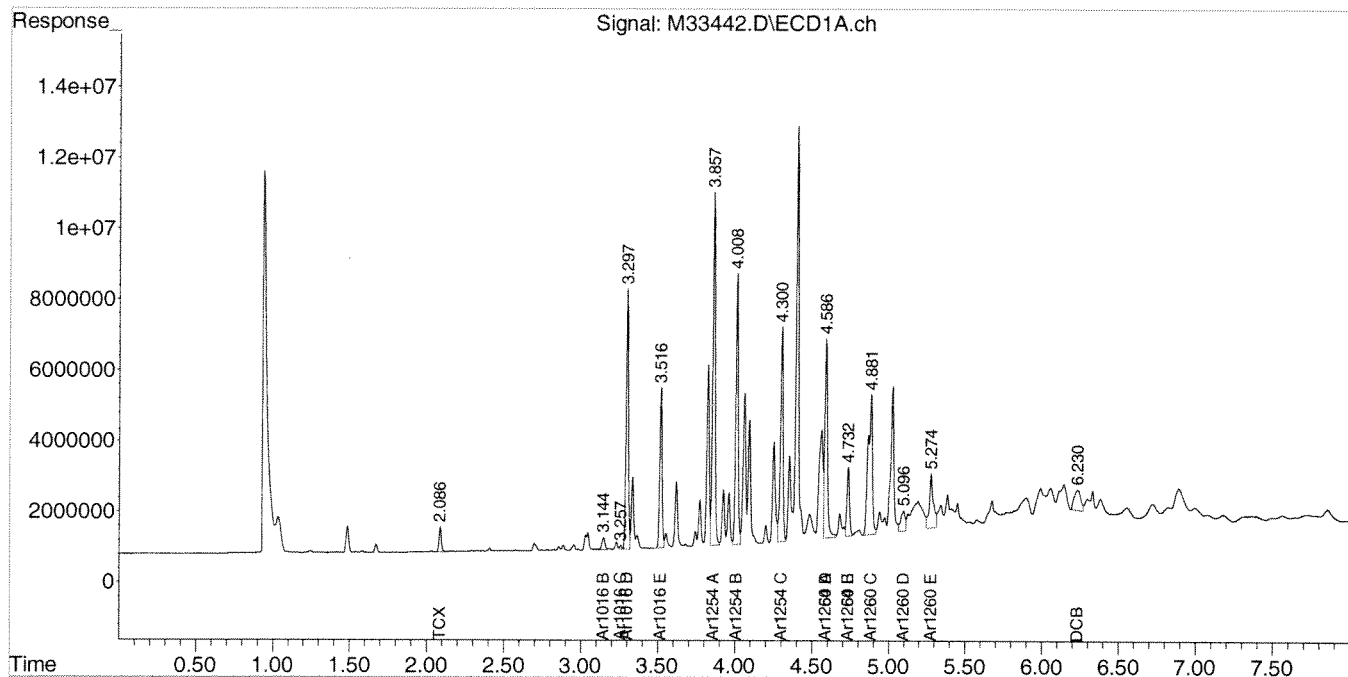
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33442.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 1:43 pm  
Operator : JK  
Sample : 68444-1,1:20,,A/C  
Misc : SOIL  
ALS Vial : 17 Sample Multiplier: 1

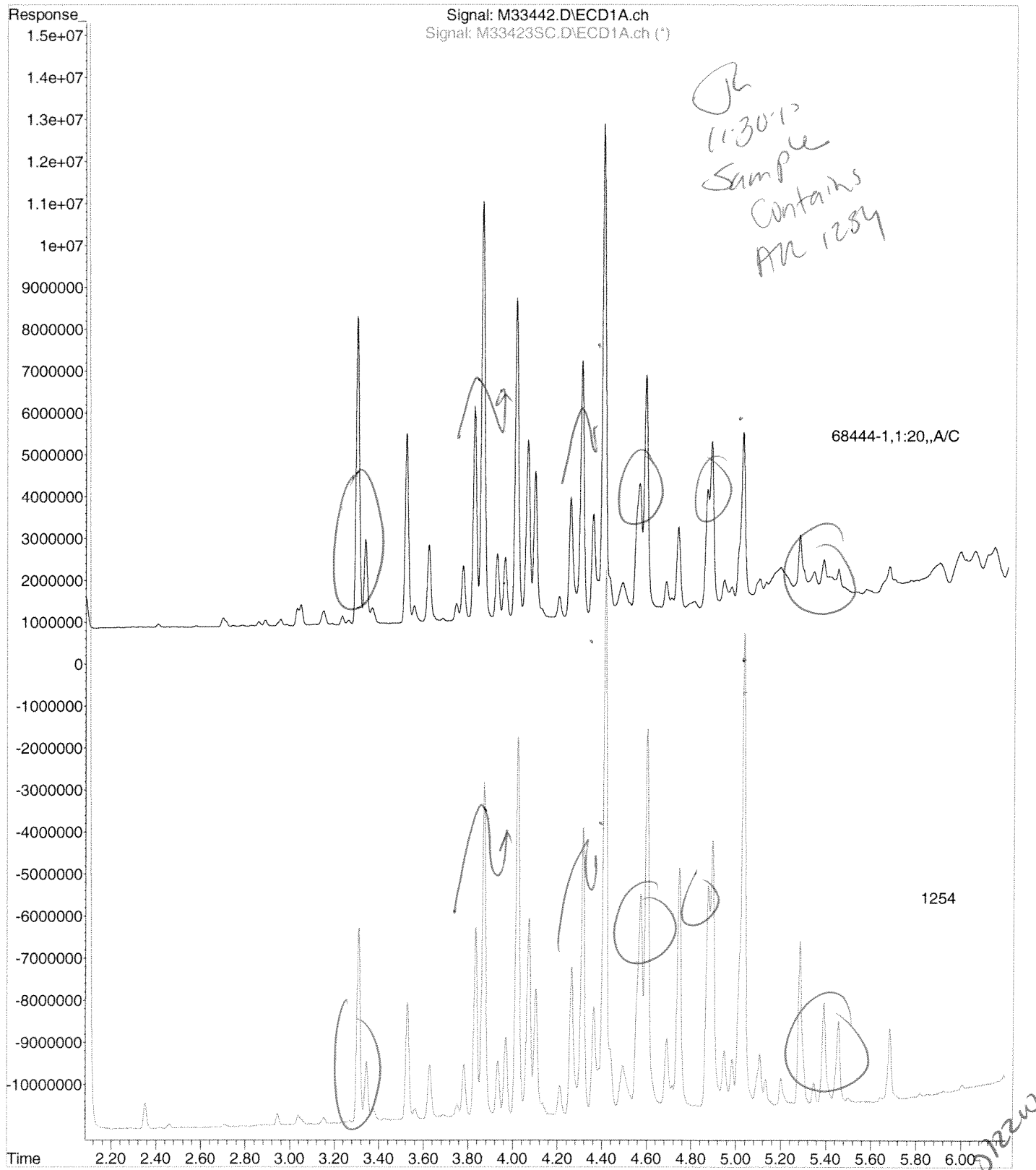
Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:52 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um





File :C:\msdchem\1\DATA\112410-M\M33442.D  
Operator : JK  
Acquired : 24 Nov 2010 1:43 pm using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: 68444-1,1:20,,A/C  
Misc Info : SOIL  
Vial Number: 17



Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1116-2 KCL

**Lab Sample ID:** 68444-2  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 50  
**Collection Date:** 10/16/10  
**Lab Receipt Date:** 11/23/10  
**Extraction Date:** 11/23/10  
**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	1650	U
PCB-1221	1650	U
PCB-1232	1650	U
PCB-1242	1650	U
PCB-1248	1650	U
PCB-1254	1650	<b>13500</b>
PCB-1260	1650	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	*	%
Decachlorobiphenyl	*	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.



PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68444
GC Column #1: STX-CLPesticides I	Sample: 68444-2,1:50,,A/C
Column ID: 0.25 mm	Data File: M33443.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 50.3
Column ID: 0.25 mm	

COMPOUND	Column #1	Column #2		
	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	13515	13545	0.2	

# Column to be used to flag RPD values greater than QC limit of 40%

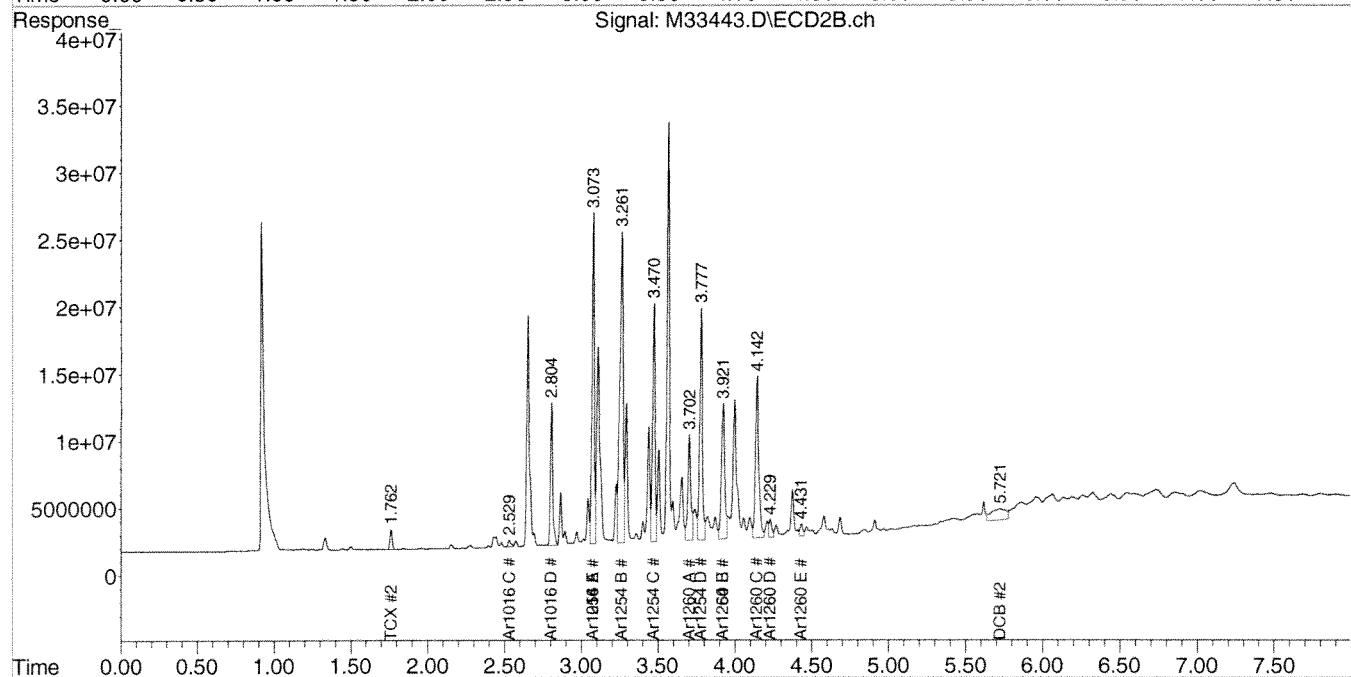
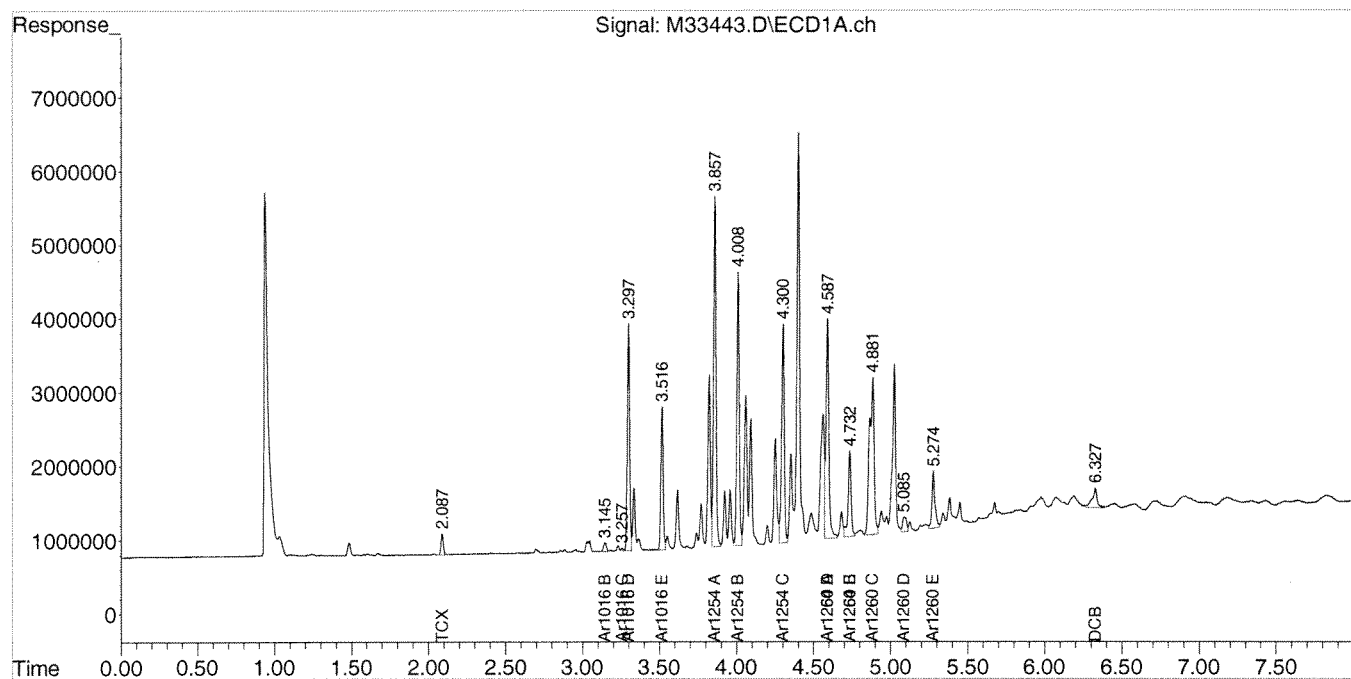
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33443.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 1:53 pm  
Operator : JK  
Sample : 68444-2,1:50,,A/C  
Misc : SOIL  
ALS Vial : 18 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:54 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1117-1 KCL

**Lab Sample ID:** 68444-3  
**Matrix:** Solid  
**Percent Solid:** 100  
**Dilution Factor:** 1.0  
**Collection Date:** 10/17/10  
**Lab Receipt Date:** 11/23/10  
**Extraction Date:** 11/23/10  
**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	<b>855</b>
PCB-1260	33	U
<b>Surrogate Standard Recovery</b>		
2,4,5,6-Tetrachloro-m-xylene	101	%
Decachlorobiphenyl	63	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68444
GC Column #1: STX-CLPesticides I	Sample: 68444-3,,A/C
Column ID: 0.25 mm	Data File: M33436.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 1.0
Column ID: 0.25 mm	

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	855	836	2.2	

# Column to be used to flag RPD values greater than QC limit of 40%

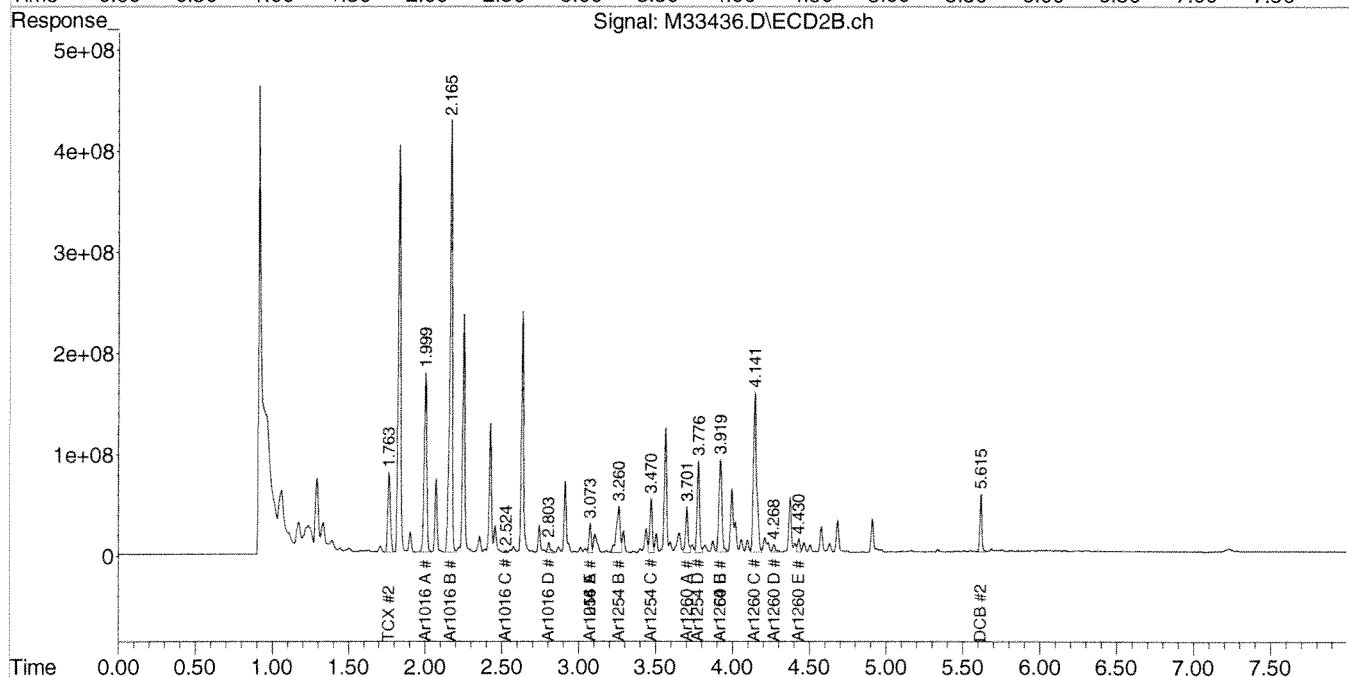
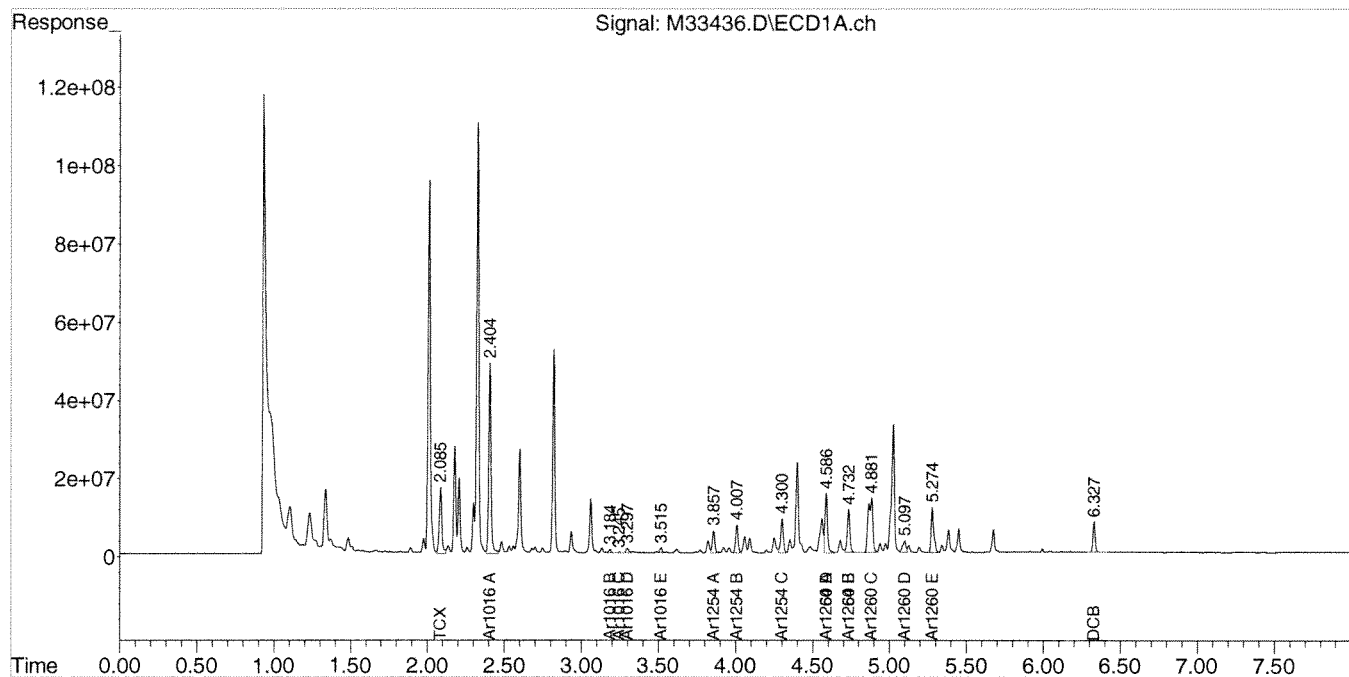
\* Values outside QC limits

Comments: \_\_\_\_\_

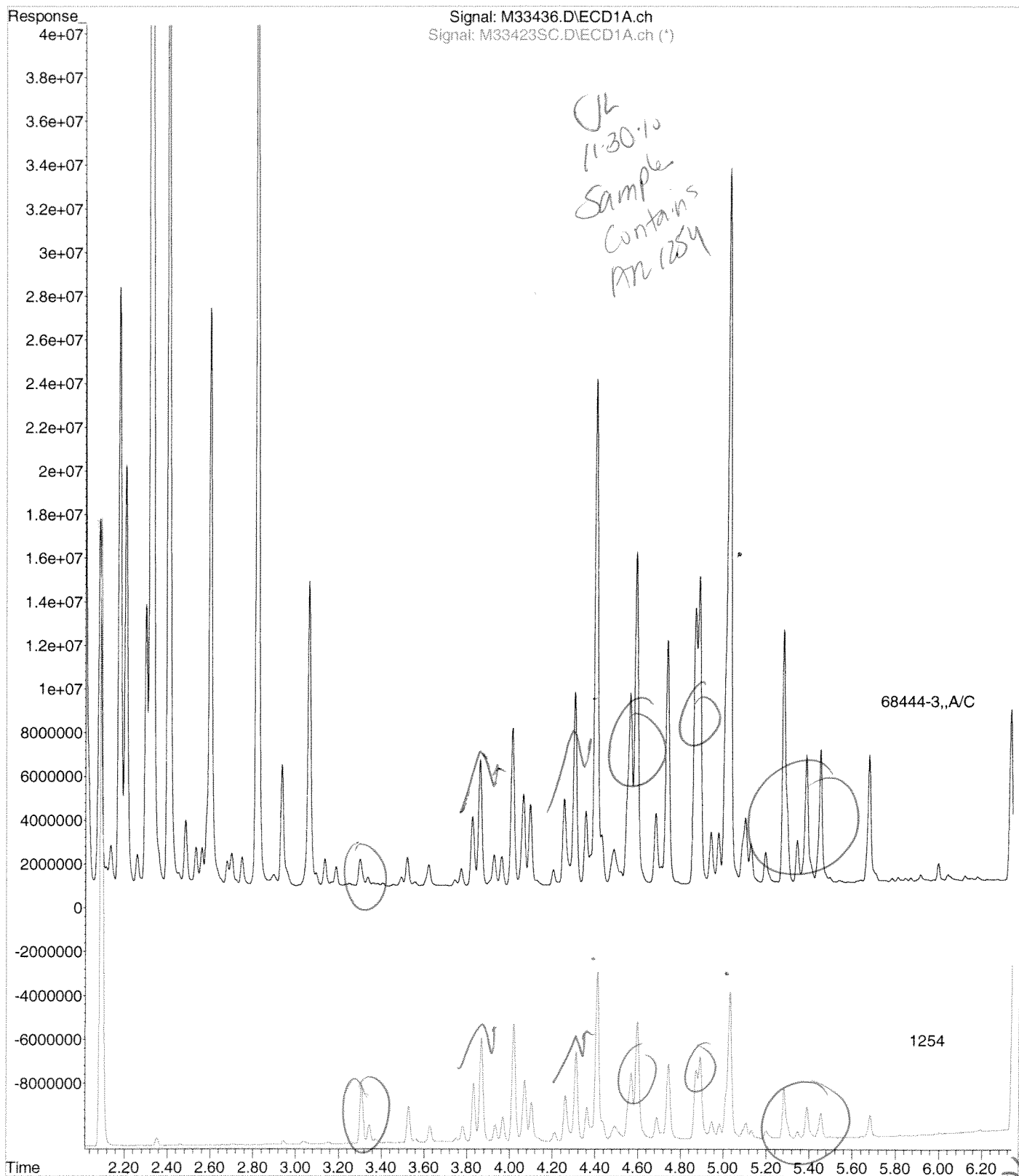
Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33436.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 12:41 pm  
Operator : JK  
Sample : 68444-3,,A/C  
Misc : SOIL  
ALS Vial : 11 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:40 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



File :C:\msdchem\1\DATA\112410-M\M33436.D  
Operator : JK  
Acquired : 24 Nov 2010 12:41 pm using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: 68444-3,,A/C  
Misc Info : SOIL  
Vial Number: 11





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New Haven CT 06510

December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1117-2 KCL

**Lab Sample ID:** 68444-4

**Matrix:** Solid

**Percent Solid:** 100

**Dilution Factor:** 5.0

**Collection Date:** 10/17/10

**Lab Receipt Date:** 11/23/10

**Extraction Date:** 11/23/10

**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	170	U
PCB-1221	170	U
PCB-1232	170	U
PCB-1242	170	U
PCB-1248	170	U
PCB-1254	170	<b>2600</b>
PCB-1260	170	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	94	%
Decachlorobiphenyl	73	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68444
GC Column #1: STX-CLPesticides I	Sample: 68444-4,1:5,,A/C
Column ID: 0.25 mm	Data File: M33444.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 5.0
Column ID: 0.25 mm	

COMPOUND	Column #1	Column #2		
	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	2502	2598	3.8	

# Column to be used to flag RPD values greater than QC limit of 40%

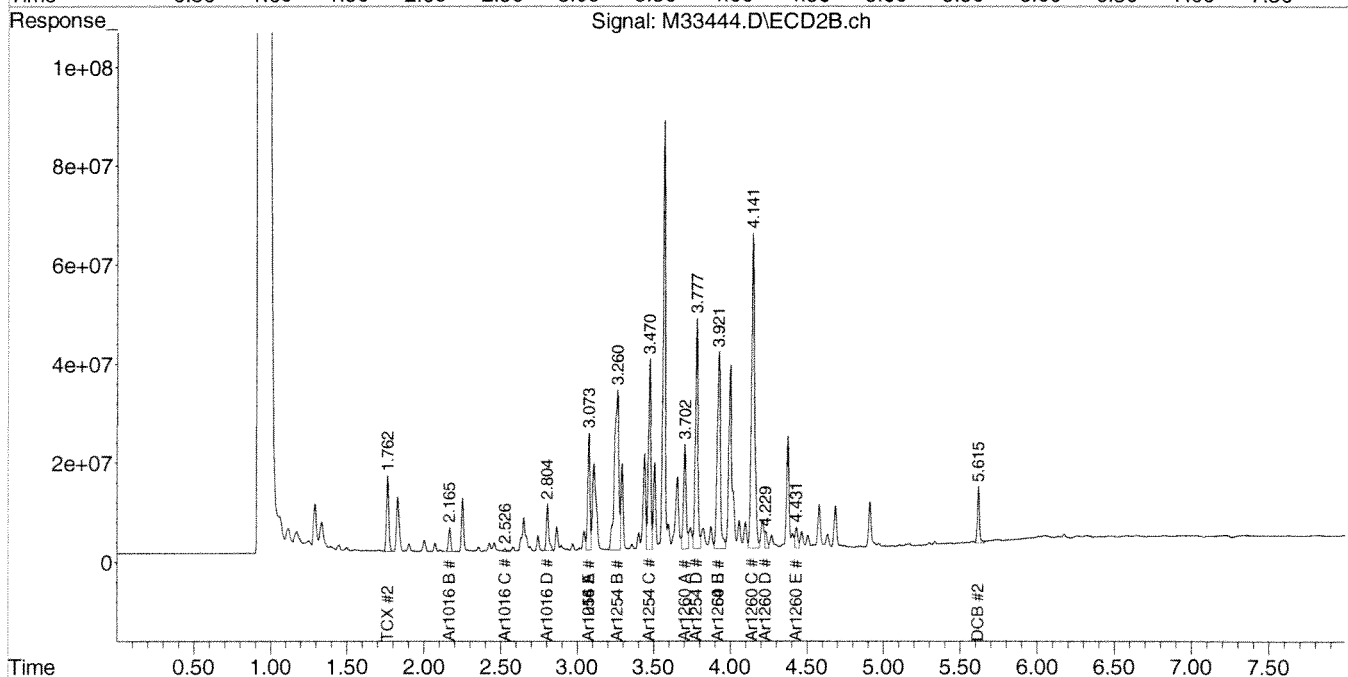
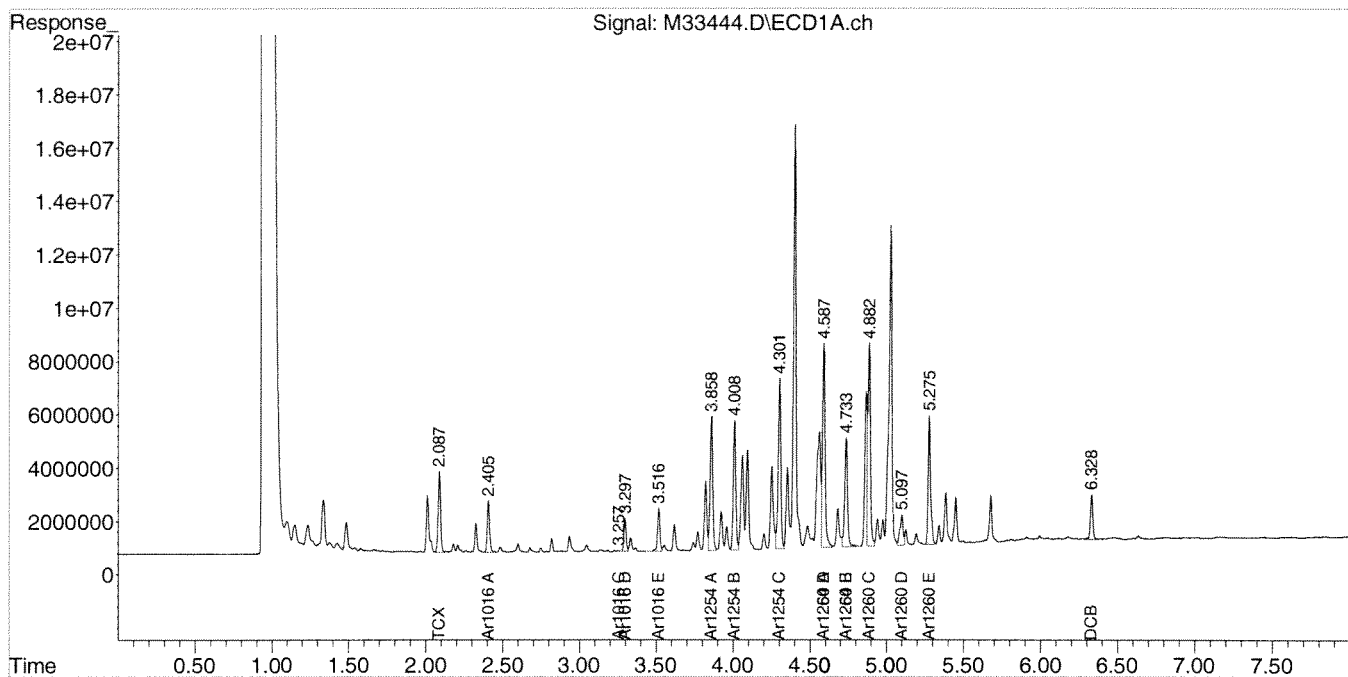
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33444.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 2:03 pm  
Operator : JK  
Sample : 68444-4,1:5,,A/C  
Misc : SOIL  
ALS Vial : 19 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:56 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1117-3 KCL

**Lab Sample ID:** 68444-5

**Matrix:** Solid

**Percent Solid:** 100

**Dilution Factor:** 1.0

**Collection Date:** 10/17/10

**Lab Receipt Date:** 11/23/10

**Extraction Date:** 11/23/10

**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	<b>615</b>
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	87	%
Decachlorobiphenyl	63	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68444
GC Column #1: STX-CLPesticides I	Sample: 68444-5,,A/C
Column ID: 0.25 mm	Data File: M33438.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 1.0
Column ID: 0.25 mm	

COMPOUND	Column #1	Column #2		
	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	615	581	5.6	

# Column to be used to flag RPD values greater than QC limit of 40%

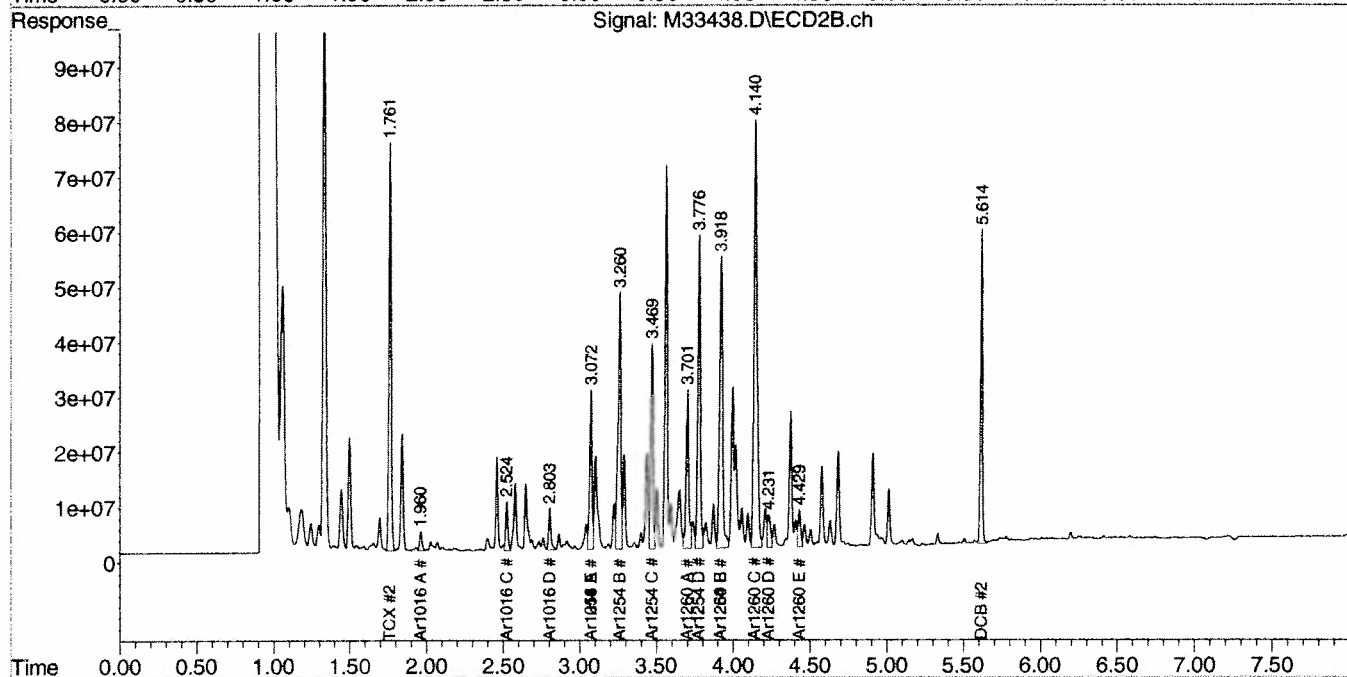
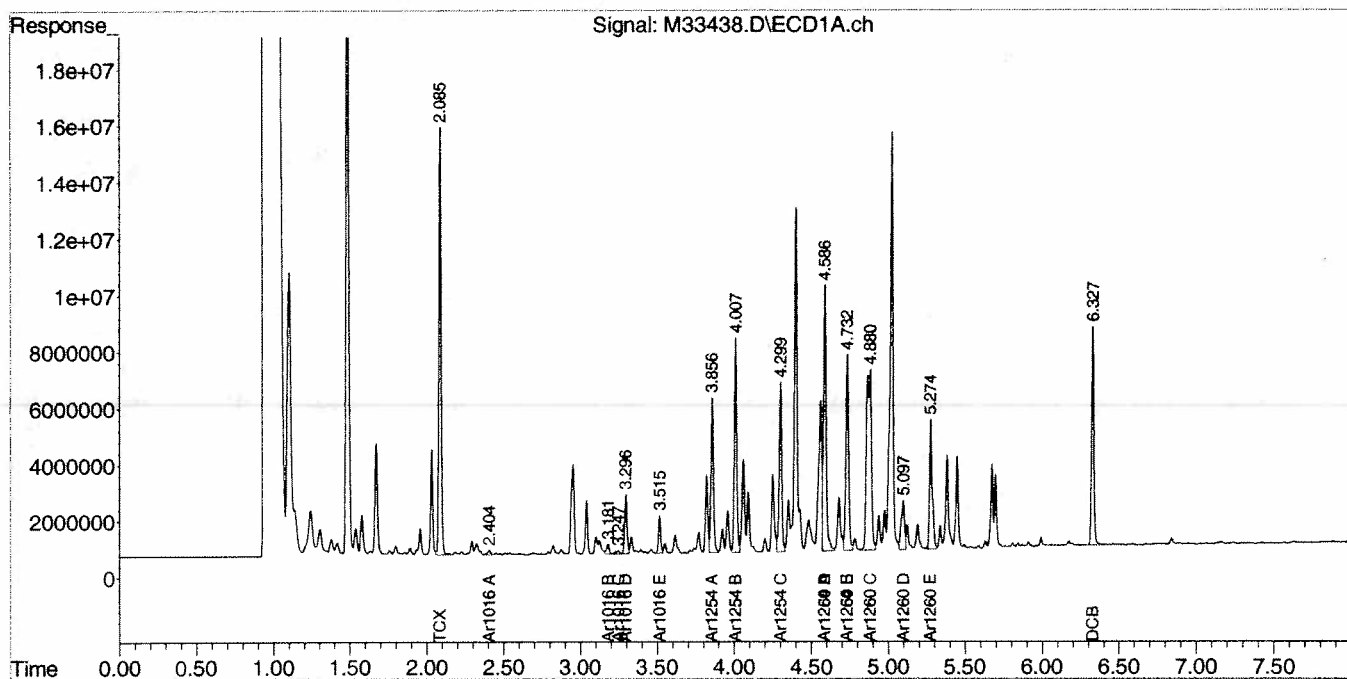
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33438.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 1:02 pm  
Operator : JK  
Sample : 68444-5,,A/C  
Misc : SOIL  
ALS Vial : 13 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:44 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1117-4 KCL

**Lab Sample ID:** 68444-6

**Matrix:** Solid

**Percent Solid:** 100

**Dilution Factor:** 1.0

**Collection Date:** 10/17/10

**Lab Receipt Date:** 11/23/10

**Extraction Date:** 11/23/10

**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	<b>45</b>
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	83	%
Decachlorobiphenyl	63	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M

SDG: 68444

GC Column #1: STX-CLPesticides I

Sample: 68444-6,,A/C

Column ID: 0.25 mm

Data File: M33439.D

GC Column #2: STX-CLPesticides II

Dilution Factor: 1.0

Column ID: 0.25 mm

COMPOUND	Column #1	Column #2		
	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	33	45	31.1	

# Column to be used to flag RPD values greater than QC limit of 40%

\* Values outside QC limits

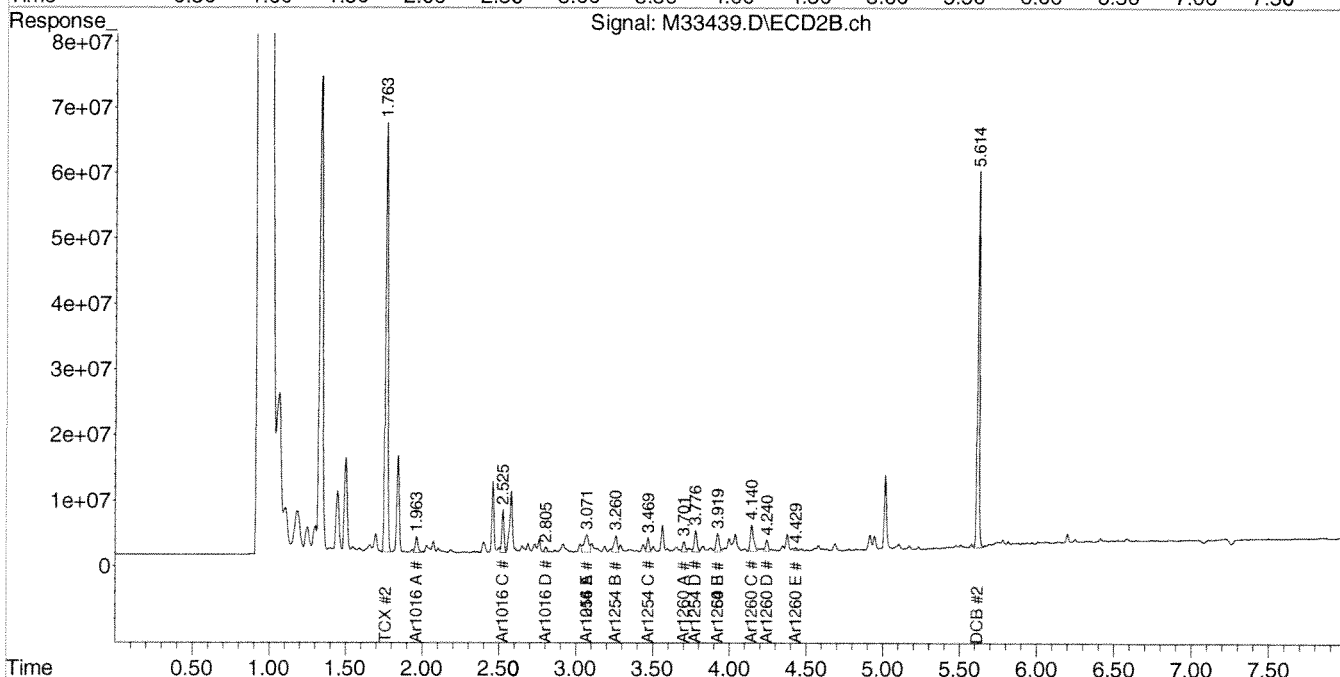
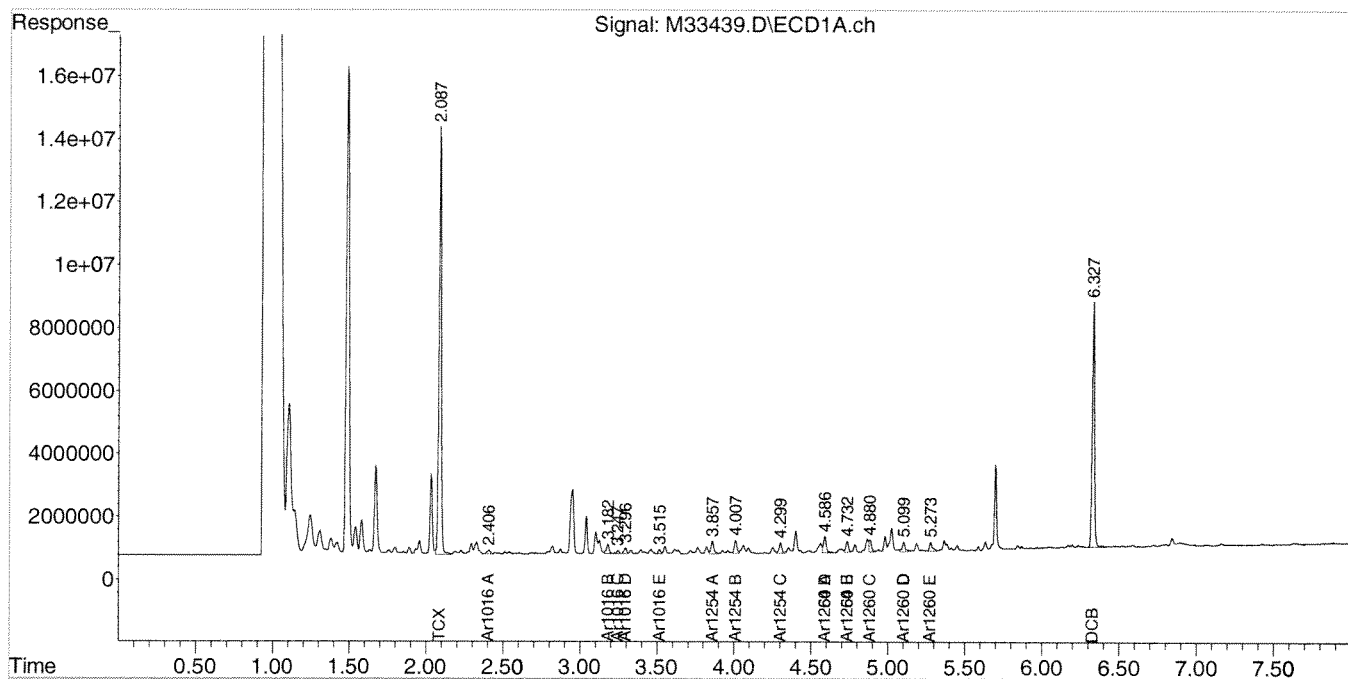
Comments: \_\_\_\_\_



Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33439.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 1:12 pm  
Operator : JK  
Sample : 68444-6,,A/C  
Misc : SOIL  
ALS Vial : 14 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:46 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1117-5 KCL

**Lab Sample ID:** 68444-7

**Matrix:** Solid

**Percent Solid:** 99

**Dilution Factor:** 2980

**Collection Date:** 10/17/10

**Lab Receipt Date:** 11/23/10

**Extraction Date:** 11/23/10

**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	98300	U
PCB-1221	98300	U
PCB-1232	98300	U
PCB-1242	98300	U
PCB-1248	98300	U
PCB-1254	98300	<b>1660000</b>
PCB-1260	98300	U

**Surrogate Standard Recovery**

2,4,5,6-Tetrachloro-m-xylene \* %  
Decachlorobiphenyl \* %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M

SDG: 68444

GC Column #1: STX-CLPesticides I

Sample: 68444-7,1:1000,,A/C

Column ID: 0.25 mm

Data File: M33445.D

GC Column #2: STX-CLPesticides II

Dilution Factor: 2976.4

Column ID: 0.25 mm

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	1659715	1534667	7.8	

# Column to be used to flag RPD values greater than QC limit of 40%

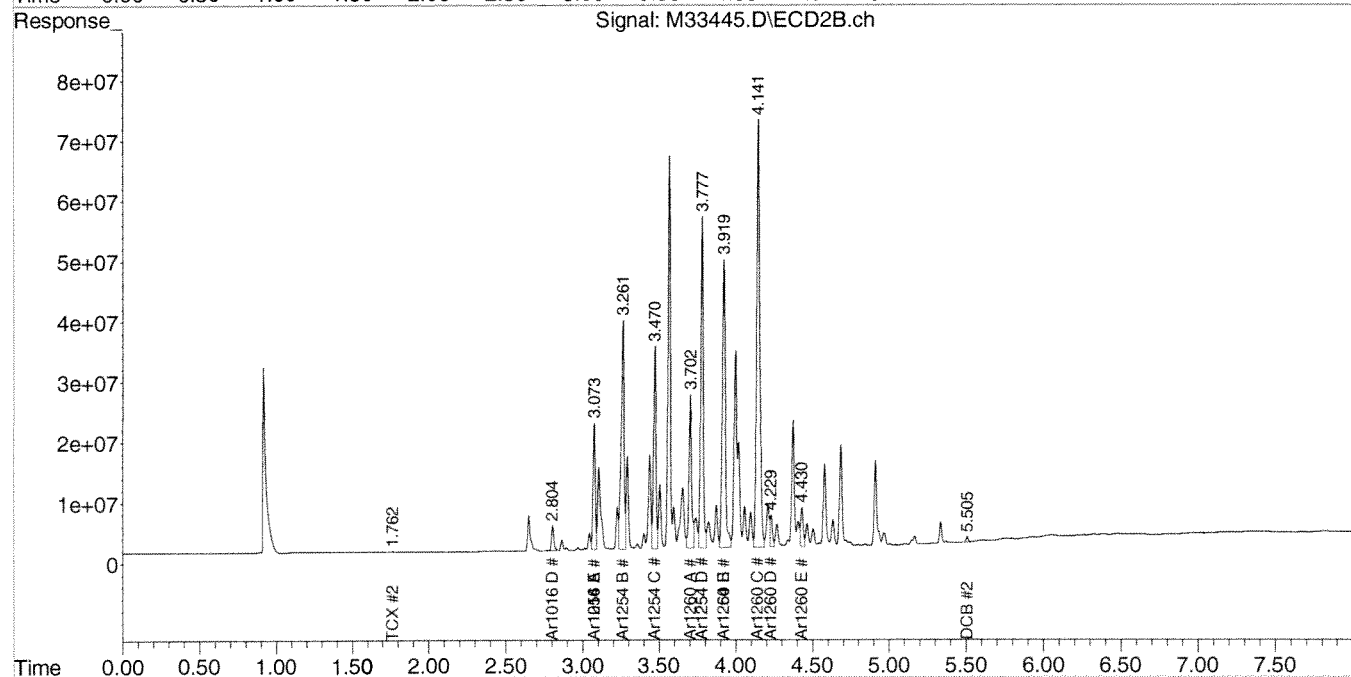
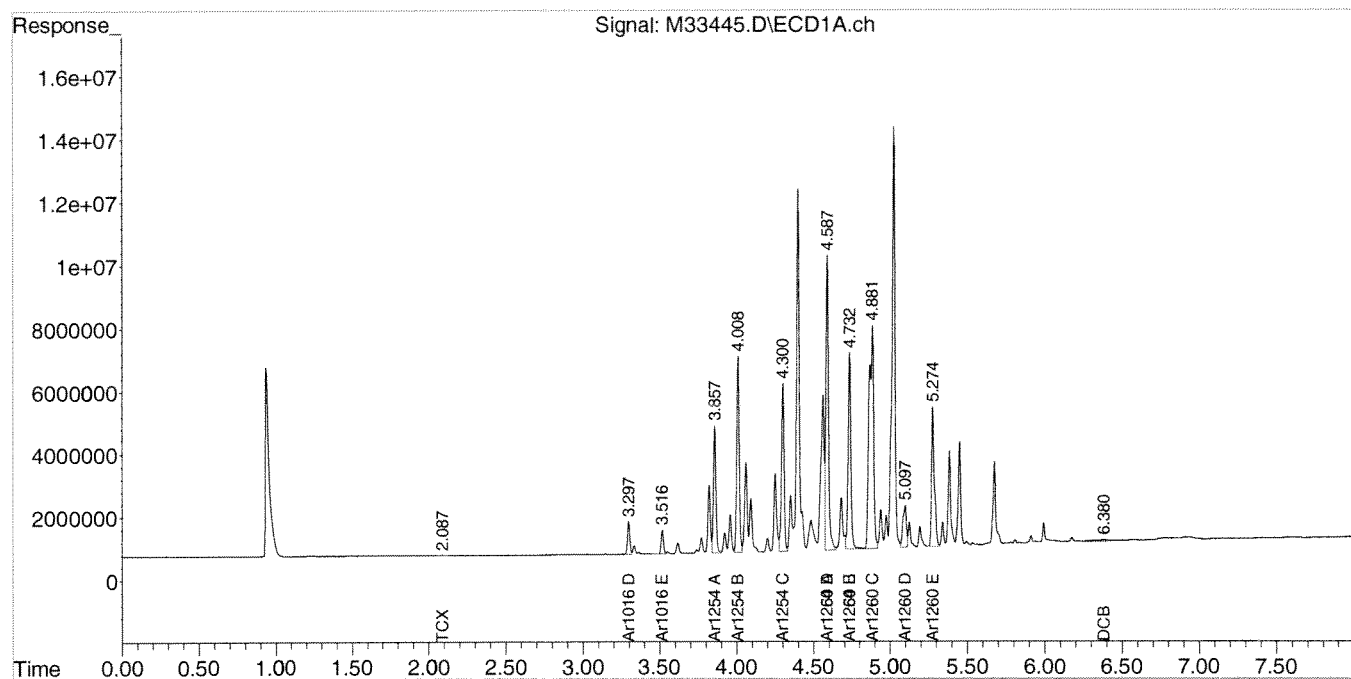
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33445.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 2:13 pm  
Operator : JK  
Sample : 68444-7,1:1000,,A/C  
Misc : SOIL  
ALS Vial : 20 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:50:58 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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December 2, 2010

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:**

**Project Number:**

**Field Sample ID:** 1117-6 KCL

**Lab Sample ID:** 68444-8  
**Matrix:** Solid  
**Percent Solid:** 98  
**Dilution Factor:** 55  
**Collection Date:** 10/17/10  
**Lab Receipt Date:** 11/23/10  
**Extraction Date:** 11/23/10  
**Analysis Date:** 11/24/10

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	1820	U
PCB-1221	1820	U
PCB-1232	1820	U
PCB-1242	1820	U
PCB-1248	1820	U
PCB-1254	1820	<b>31700</b>
PCB-1260	1820	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	*	%
Decachlorobiphenyl	*	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.  
\* The surrogates were diluted out.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68444
GC Column #1: STX-CLPesticides I	Sample: 68444-8,1:20,,A/C
Column ID: 0.25 mm	Data File: M33447.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 55.0
Column ID: 0.25 mm	

COMPOUND	Column #1	Column #2	RPD		#
	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)			
PCB 1254	31664	29655	6.6		

# Column to be used to flag RPD values greater than QC limit of 40%

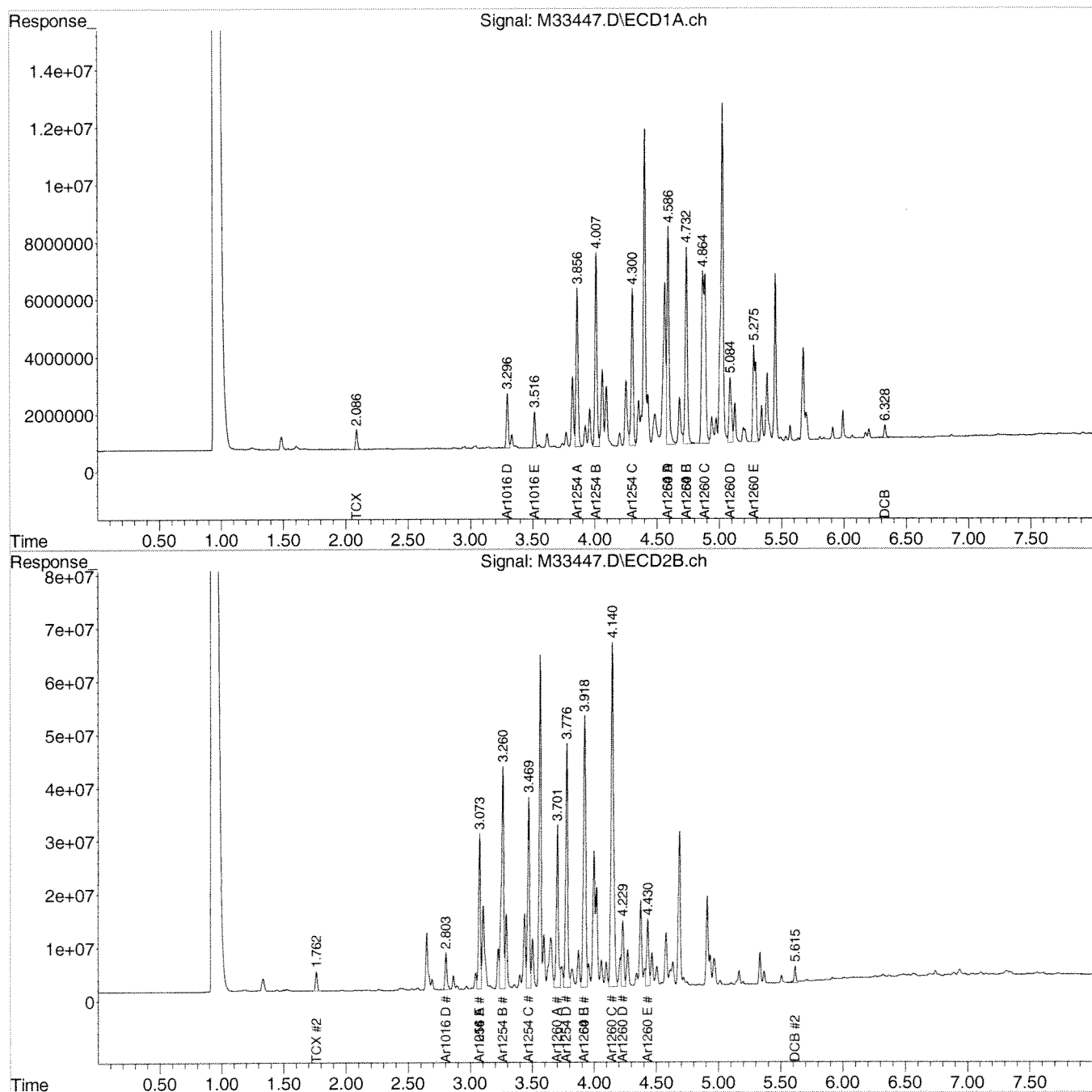
\* Values outside QC limits

Comments: \_\_\_\_\_

Data Path : C:\msdchem\1\DATA\112410-M\  
Data File : M33447.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 24 Nov 2010 2:34 pm  
Operator : JK  
Sample : 68444-8,1:20,,A/C  
Misc : SOIL  
ALS Vial : 22 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Nov 29 08:51:02 2010  
Quant Method : C:\msdchem\1\METHODS\PCB110310.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Wed Nov 03 16:48:45 2010  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



PCB  
QC FORMS



$$w = 25$$

SDG: 68444

---

# Column to be used to flag recovery values outside of QC limits  
\* Values outside QC limits  
D System Monitoring Compound diluted out

PCB SOIL  
LABORATORY CONTROL SAMPLE/DUPLICATE  
PERCENT RECOVERY

Instrument ID: M

GC Column #1: STX-CLPesticides I

Column ID: 0.25 mm

GC Column #2: STX-CLPesticides II

Column ID: 0.25 mm

SDG: 68444

Non-spiked sample: B112310PSOX,,A/C

Spike: L112310PSOX,,A/C

Spike duplicate: LD112310PSOX,,A/C

COMPOUND	LCS SPIKE	LCSD SPIKE	LOWER	UPPER	RPD	NON-SPIKE	SPIKE	SPIKE	SPIKE DUP		SPIKE DUP			
	ADDED (ug/kg)	ADDED (ug/kg)	LIMIT	LIMIT	LIMIT	RESULT (ug/kg)	RESULT (ug/kg)	% REC	#	RESULT (ug/kg)	% REC	#	RPD	#
PCB 1016	200	200	65	140	30	0	185	92		185	92		0.2	
PCB 1260	200	200	60	130	30	0	188	94		192	96		2.4	
PCB 1016 #2	200	200	65	140	30	0	216	108		237	118		8.9	
PCB 1260 #2	200	200	60	130	30	0	177	89		182	91		2.5	

# Column to be used to flag recovery and RPD values outside of QC limits

\* Values outside QC limits

LCS/LCSD spike added values have been weight adjusted.

Non-spike result of "0" used in place of "U" to allow calculation of spike recovery.

Comments: \_\_\_\_\_  
\_\_\_\_\_

## CHAIN OF CUSTODIES

# Chain Of Custody Form

<b>analytical environmental laboratory LLC</b> 195 Commerce Way Suite E Portsmouth, NH 03801 Phone (603) 436-5111 Fax (603) 430-2151		<b>For Analytics Use Only</b> Rev. 4 03/28/08	
Project#: _____ Company: <u>YALE EHS</u> Contact: <u>STEVE MURPHY / ROB KLEN</u> Address: <u>135 COLLEGE ST, STE 100</u> <u>NEW HAVEN, CT 06510</u> Phone: <u>203-737-9453</u> PO# _____ Quote # _____ Sampler (Signature): <u>[Signature]</u>	Matrix Key: C = Concrete WP = Wipe WW = Wastewater SW = Surface Water GW = Groundwater DW = Drinking Water S = Soil/Sludge O = Oil E = Extract X = Other	Samples were: 1) Shipped or hand-delivered 2) Temp blank °C <u>8.2</u> 3) Received in good condition <u>Y</u> or N 4) pH checked by: <u>N/A</u> 5) Labels checked by: <u>11/23/10</u>	Received By: <u>[Signature]</u> Date: <u>11/23/10</u> Time: <u>10:30</u>
Station Identification 1116-1 KEL 16001 1116-2 KEL 16001 1116-7-1 KEL 17001 1117-2 KEL 17001 1117-3 KEL 17001 1117-4 KEL 17001 1117-5 KEL 17001 1117-6 KEL 17001 1117-7 KEL 17001	Sample Date 11/16/01 11/16/01 11/16/01 11/17/01 11/17/01 11/17/01 11/17/01 11/17/01	Sample Time 11:00 11:00 11:00 11:00 11:00 11:00 11:00 11:00	Analysis PBB ADJUSTED BRICK/CONCRETE EPA METHOD 8082 3540C 30X4LET EXTRACTION
Preservation Unpres H <sub>2</sub> O HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> HCL Methanol Other	Container number/type Matrix pH Analytics Sample # 68444-1 2 3 4 5 6 7 8	Container Key P=plastic G=glass	Received By: <u>[Signature]</u> Date: <u>11/23/10</u> Time: <u>10:30</u>
Email Results to: <u>ROB.KLEN@yale.edu</u> Comments / Instructions: * Sample does not exist, ok to CROSS OFF COC as per Steve M. - CP 11/23/10		Project Requirements: Report Type: <input checked="" type="checkbox"/> MCP <input type="checkbox"/> CTCT <input type="checkbox"/> DOD <input type="checkbox"/> Standard State: <input type="checkbox"/> NH <input type="checkbox"/> MA <input type="checkbox"/> ME <input checked="" type="checkbox"/> CT <input type="checkbox"/> RI State Standard: (eg. S-1 or GW-1) EDD Required: Y* N Type: —	Received By: <u>[Signature]</u> Date: <u>11/23/10</u> Time: <u>10:30</u>
Turnaround Request Standard <input type="checkbox"/> Priority <input type="checkbox"/> Due Date: <u>12/3</u>	Lab Approval Required [Signature]	Page — of	Received By: <u>[Signature]</u> Date: <u>11/23/10</u> Time: <u>10:30</u>

PH-103  
 STD. TURNAROUND DEC 310 ASSAYS DUE

## ANALYTICS SAMPLE RECEIPT CHECKLIST



AEL LAB#:

68444

CLIENT:

Yale EHS

PROJECT:

N/A

COOLER NUMBER:

Client cooler

NUMBER OF COOLERS:

1

DATE RECEIVED:

11/23/10

## A: PRELIMINARY EXAMINATION:

DATE COOLER OPENED:

11/23/10

1. Cooler received by (initials):

LM

Date Received:

11/23/10

2. Circle one:

Hand delivered  
(If so, skip 3)

Shipped

3. Did cooler come with a shipping slip?

Y

N

3a. Enter carrier name and airbill number here:

Fed Ex 7964 7672 5714

4. Were custody seals on the outside of cooler?

How many &amp; where:

N/A

Seal Date:

N/A

Seal Name:

N/A

5. Did the custody seals arrive unbroken and intact upon arrival?

N/A

Y

N

6. COC#:

N/A

7. Were Custody papers filled out properly (ink, signed, etc)?

Y

N

8. Were custody papers sealed in a plastic bag?

Y

N

9. Did you sign the COC in the appropriate place?

Y

N

10. Was the project identifiable from the COC papers?

Y

N

11. Was enough ice used to chill the cooler?

Y N

Temp. of cooler:

8.2°C

## B. Log-In: Date samples were logged in:

11/23/10

By:

lmt

12. Type of packing in cooler (bubble wrap, popcorn)

Y

N

13. Were all bottles sealed in separate plastic bags?

Y

N

14. Did all bottles arrive unbroken and were labels in good condition?

Y

N

15. Were all bottle labels complete (ID, Date, time, etc.)

Y

N

16. Did all bottle labels agree with custody papers?

Y

N

17. Were the correct containers used for the tests indicated:

Y

N

18. Were samples received at the correct pH?

N/A

Y

N

19. Was sufficient amount of sample sent for the tests indicated?

Y

N

20. Were bubbles absent in VOA samples?

N/A

Y

N

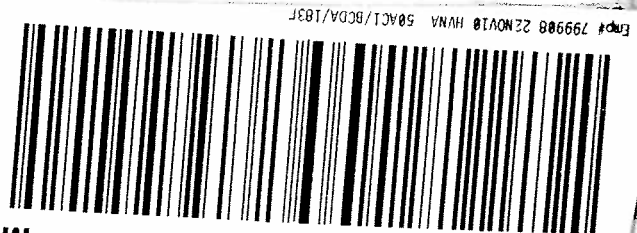
If NO, List Sample ID's and Lab #s:

21. Laboratory labeling verified by (initials):

cl

Date:

11/23/10



Emp# 799908 22 NOV 10 HVNA 50ACT/BCDA/103T

03 IGGA

TUE - 23 NOV A2  
PRIORITY OVERNIGHT  
DSR  
03801  
NH-US  
MHT

NOV A2  
FedEx  
7964 7672 5714  
OVERNIGHT  
0301

RT 328 1 C  
FZ 5714  
11.23

February 9, 2011

Mr. Rob Klein  
Yale University Environmental Health & Safety  
135 College Street  
New Haven CT 06510

**RE: Analytical Results Case Narrative  
Analytics # 68983  
KCL MOCK UP**

Dear Mr. Klein;

Enclosed please find the analytical results for samples submitted for the above-mentioned project. The attached Cover Page lists the sample IDs, Lab tracking numbers and collection dates for the samples included in this deliverable.

Samples were analyzed Polychlorinated Biphenyls (PCBs) by EPA Method 8082.

Unless otherwise noted in the Non-conformance Summary listed below, all of the quality control (QC) criteria including initial calibration, calibration verification, surrogate recovery, holding time and method accuracy/precision for these analyses were within acceptable limits.

This Level II data package has been assembled in the following order:

- Case Narrative/Non-Conformance Summary
- Sample Log Sheet - Cover Page
- PCB Form 1 Data Sheet for Samples and Blanks
- Chromatograms
- PCB Form 10 Confirmation Results
- PCB Form 3 MS/MSD (LCS) Recoveries
- Chain of Custody (COC) Forms

## QC NON-CONFORMANCE SUMMARY

### Sample Receipt:

The cooler temperature upon receipt was 9.9<sup>0</sup> C upon receipt at the laboratory. In addition the sample names on the container labels did not match the Chain of Custody (COC). The client was notified and instructed the lab to proceed with analysis and to report the sample names off of the container labels, not the COC.

### PCBs by EPA Method 8082:

The closing continuing calibration standard (M32522SC) had low Decachlorobiphenyl surrogate recovery on column#2. Column #1 was in control for all analytes. Surrogate recoveries were reported from column #1.

Sincerely,  
ANALYTICS Environmental Laboratory, LLC



Stephen Knollmeyer  
Laboratory Director



Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

**Report Number: 68983**

**Revision: Rev. 0**

**Re: KCL MOCK UP (Project No: 102010)**

Enclosed are the results of the analyses on your sample(s). Samples were received on 04 February 2011 and analyzed for the tests listed. Samples were received in acceptable condition, with the exceptions noted below or on the chain of custody. These results pertain to samples as received by the laboratory and for the analytical tests requested on the chain of custody. The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. Please see individual reports for specific methodologies and references.


<u>Lab Number</u>	<u>Sample Date</u>	<u>Station Location</u>	<u>Analysis</u>	<u>Comments</u>
68983-1	02/01/11	KCL 2-1-1	EPA 8082 (PCBs only)	
68983-2	02/01/11	KCL 2-1-2	EPA 8082 (PCBs only)	
68983-3	02/01/11	KCL 2-1-3	EPA 8082 (PCBs only)	
68983-4	02/01/11	KCL 2-1-4	EPA 8082 (PCBs only)	

**Sample Receipt Exceptions:** Samples received at 9.9 °C which was outside laboratory acceptance criteria. The client was notified and analysis continued.

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Virginia, Maryland, and is accredited by the Department of Defense (DOD) ELAP program. A list of actual certified parameters is available upon request.

If you have any questions on these results, please do not hesitate to contact us.

Authorized signature

  
Stephen L. Knollmeyer Lab. Director

Date

02/09/2011

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consent of Analytics Environmental Laboratory, LLC.**

### Surrogate Compound Limits

Matrix: Units:	Aqueous % Recovery	Solid % Recovery	Method
<b>Volatile Organic Compounds - Drinking Water</b>			
1,4-Difluorobenzene	70-130		EPA 524.2
Bromofluorobenzene	70-130		
1,2-Dichlorobenzene-d4	70-130		
<b>Volatile Organic Compounds</b>			
1,2-Dichloroethane-d4	70-120	70-120	EPA 624/8260B
Toluene-d8	85-120	85-120	
Bromofluorobenzene	75-120	75-120	
<b>Semi-Volatile Organic Compounds</b>			
2-Fluorophenol	20-110	35-105	EPA 625/8270C
d5-Phenol	15-110	40-100	
d5-nitrobenzene	40-110	35-100	
2-Fluorobiphenyl	50-110	45-105	
2,4,6-Tribromophenol	40-110	40-125	
d14-p-terphenyl	50-130	30-125	
<b>PAH's by SIM</b>			
d5-nitrobenzene	21-110	35-110	EPA 8270C
2-Fluorobiphenyl	36-121	45-105	
d14-p-terphenyl	33-141	30-125	
<b>Pesticides and PCBs</b>			
2,4,5,6-Tetrachloro-m-xylene (TCX)	46-122	40-130	EPA 608/8082
Decachlorobiphenyl (DCB)	40-135	40-130	
<b>Herbicides</b>			
Dichloroacetic acid (DCAA)	30-150	30-150	
<b>Gasoline Range Organics/TPH Gasoline</b>			
Trifluorotoluene TFT (FID)	60-140	60-140	MEDEP 4217/EPA 8015
Bromofluorobenzene (BFB) (FID)	60-140	60-140	
Trifluorotoluene TFT (PID)	60-140	60-140	
Bromofluorobenzene (BFB) (PID)	60-140	60-140	
<b>Diesel Range Organics/TPH Diesel</b>			
m-terphenyl	60-140	60-140	MEDEP 4125/EPA 8015/CT ETPH
<b>Volatile Petroleum Hydrocarbons</b>			
2,5-Dibromotoluene (PID)	70-130	70-130	MADEP VPH May 2004 Rev1.1
2,5-Dibromotoluene (FID)	70-130	70-130	
<b>Extracatable Petroleum Hydrocarbons</b>			
1-chloro-octadecane (aliphatic)	40-140	40-140	MADEP EPH May 2004 Rev1.1
o-Terphenyl (aromatic)	40-140	40-140	
2-Fluorobiphenyl (Fractionation)	40-140	40-140	
2-Bromonaphthalene (fractionation)	40-140	40-140	

## PCB DATA SUMMARIES

Mr. Rob Klein  
Yale University Environmental Health &  
Safety  
135 College Street  
New Haven CT 06510

February 9, 2011

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL MOCK UP  
**Project Number:** 102010  
**Field Sample ID:** Lab QC

**Lab Sample ID:** B020411PSOX  
**Matrix:** Soil  
**Percent Solid:** N/A  
**Dilution Factor:** 1.0  
**Collection Date:**  
**Lab Receipt Date:**  
**Extraction Date:** 02/04/11  
**Analysis Date:** 02/07/11

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	U
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	98	%
Decachlorobiphenyl	78	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

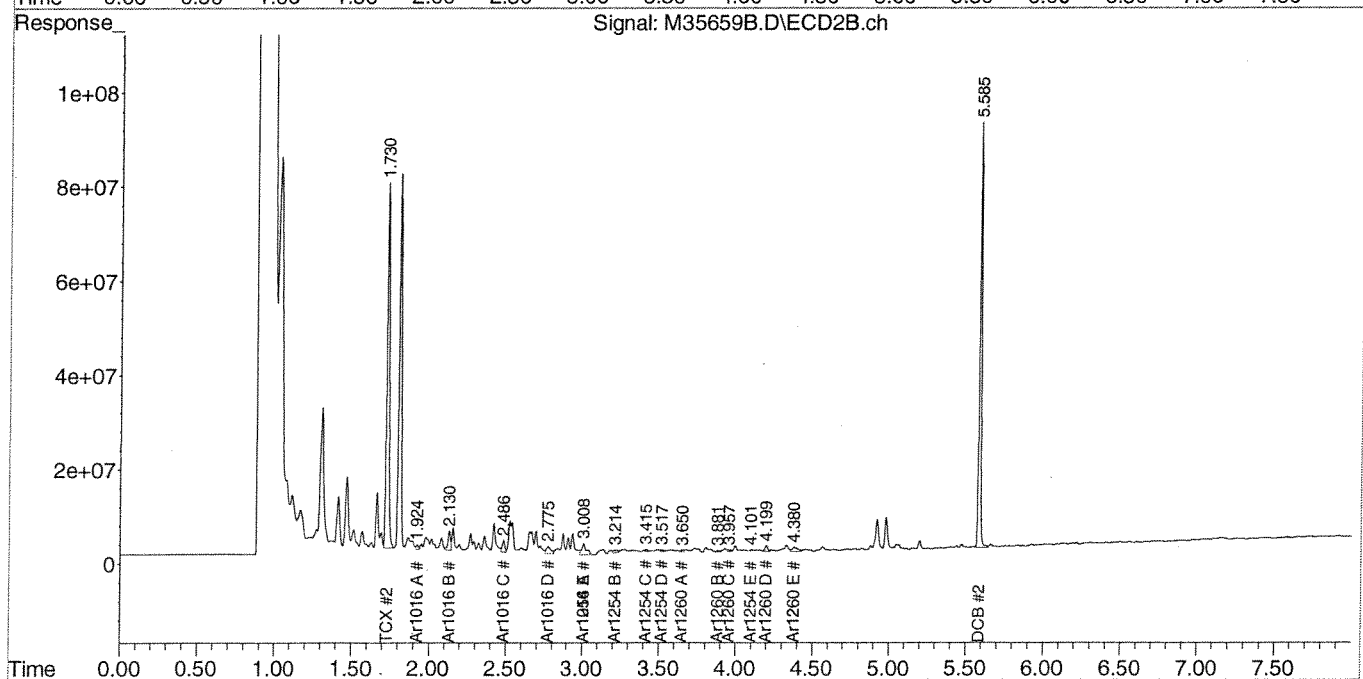
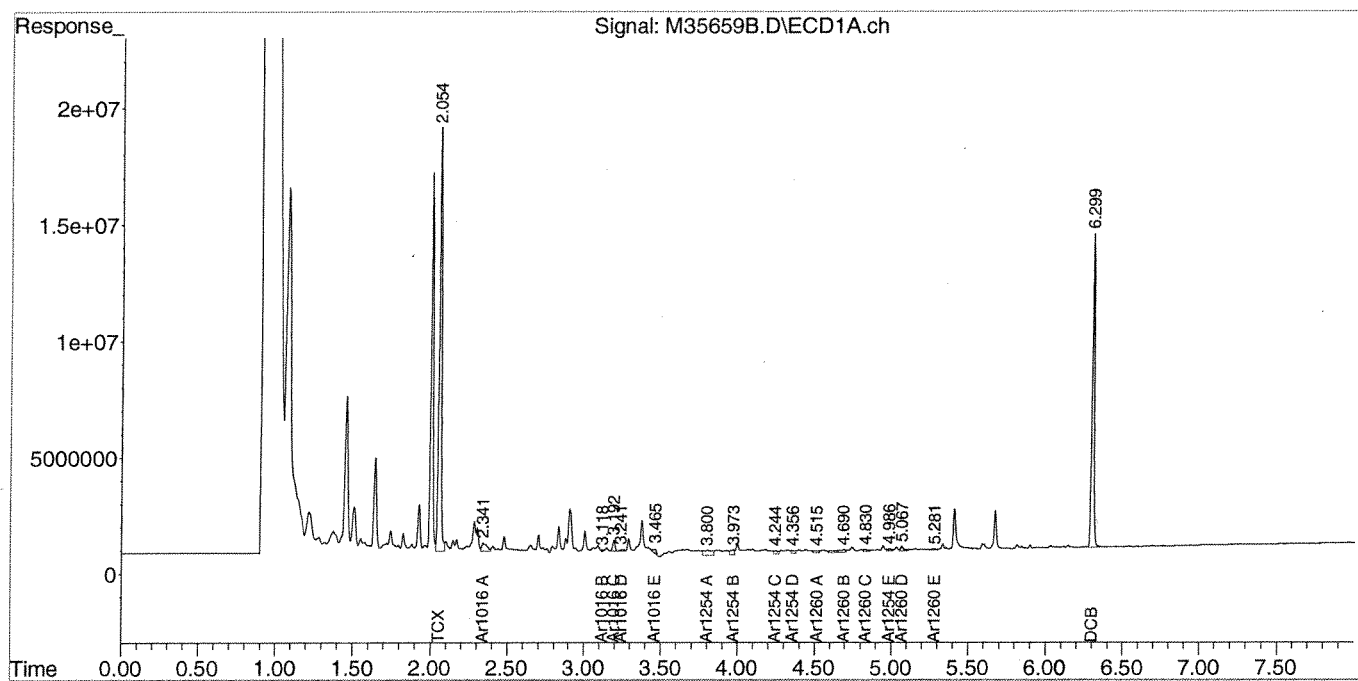
Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

Data Path : C:\msdchem\1\DATA\020711-M\  
Data File : M35659B.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 7 Feb 2011 4:44 pm  
Operator : JK  
Sample : B020411PSOX,,A/C  
Misc : SOIL  
ALS Vial : 6 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Feb 08 07:59:51 2011  
Quant Method : C:\msdchem\1\METHODS\PCB020711.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Mon Feb 07 15:27:39 2011  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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February 9, 2011

**SAMPLE DATA**

**CLIENT SAMPLE ID**  
**Project Name:** KCL MOCK UP  
**Project Number:** 102010  
**Field Sample ID:** Lab QC

**Lab Sample ID:** B020411PSOX RR  
**Matrix:** Soil  
**Percent Solid:** N/A  
**Dilution Factor:** 1.0  
**Collection Date:**  
**Lab Receipt Date:**  
**Extraction Date:** 02/04/11  
**Analysis Date:** 02/08/11

PCB ANALYTICAL RESULTS		
COMPOUND	Quantitation Limit µg/kg	Results µg/kg
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	U
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	100	%
Decachlorobiphenyl	74	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

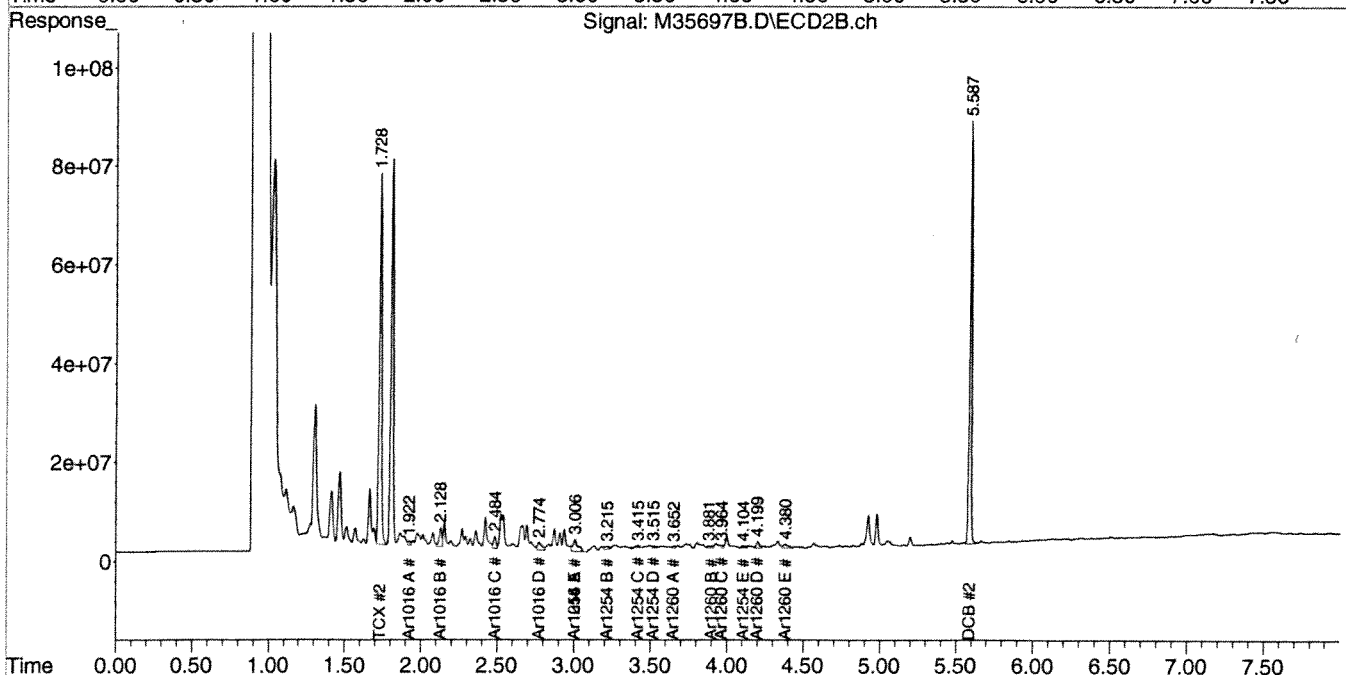
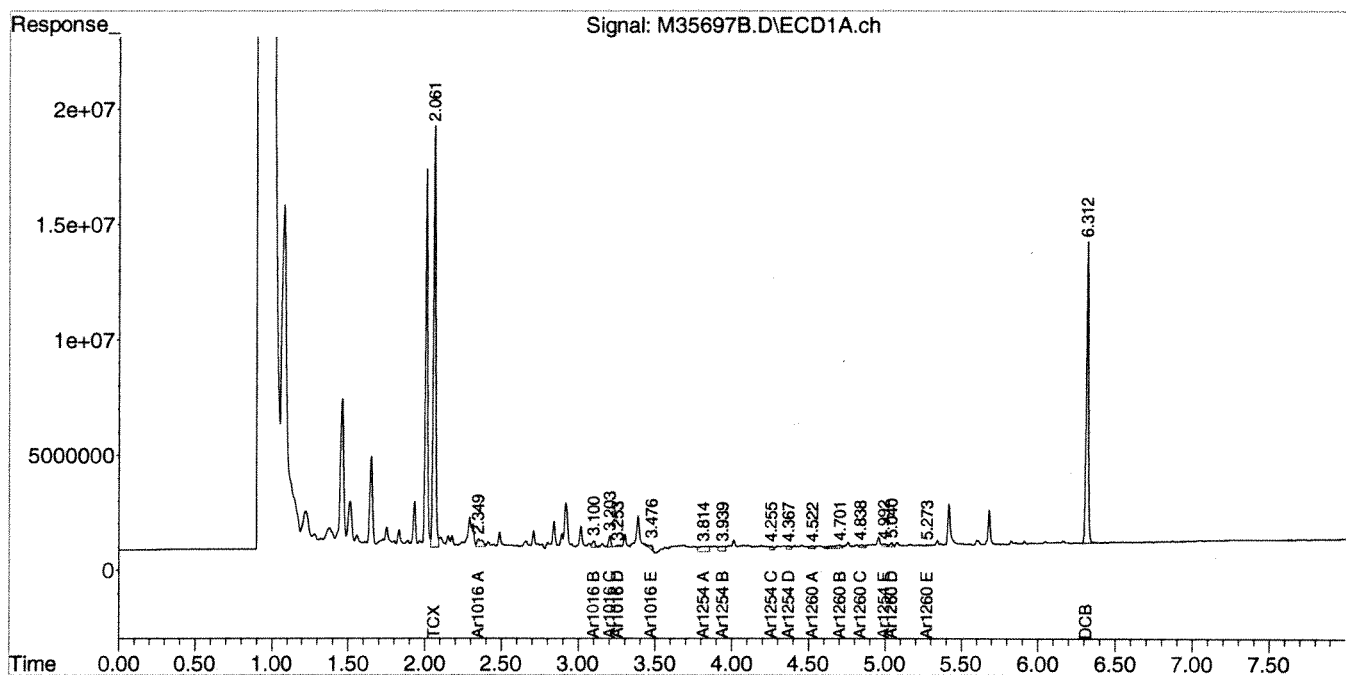
Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

Data Path : C:\msdchem\1\DATA\020811-M\  
Data File : M35697B.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 8 Feb 2011 9:32 am  
Operator : JK  
Sample : B020411PSOX,RR2,,A/C  
Misc : SOIL  
ALS Vial : 6 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Feb 08 10:25:53 2011  
Quant Method : C:\msdchem\1\METHODS\PCB020711.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Mon Feb 07 15:22:15 2011  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



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New Haven CT 06510

February 9, 2011

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL MOCK UP  
**Project Number:** 102010  
**Field Sample ID:** KCL 2-1-1

**Lab Sample ID:** 68983-1  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 1.9  
**Collection Date:** 02/01/11  
**Lab Receipt Date:** 02/04/11  
**Extraction Date:** 02/04/11  
**Analysis Date:** 02/08/11

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	63	U
PCB-1221	63	U
PCB-1232	63	U
PCB-1242	63	U
PCB-1248	63	U
PCB-1254	63	<b>1340</b>
PCB-1260	63	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	91	%
Decachlorobiphenyl	70	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.



PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68983
GC Column #1: STX-CLPesticides I	Sample: 68983-1,1:2,,A/C
Column ID: 0.25 mm	Data File: M35698.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 1.9
Column ID: 0.25 mm	

COMPOUND	Column #1	Column #2		
	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	1256	1339	6.4	

# Column to be used to flag RPD values greater than QC limit of 40%

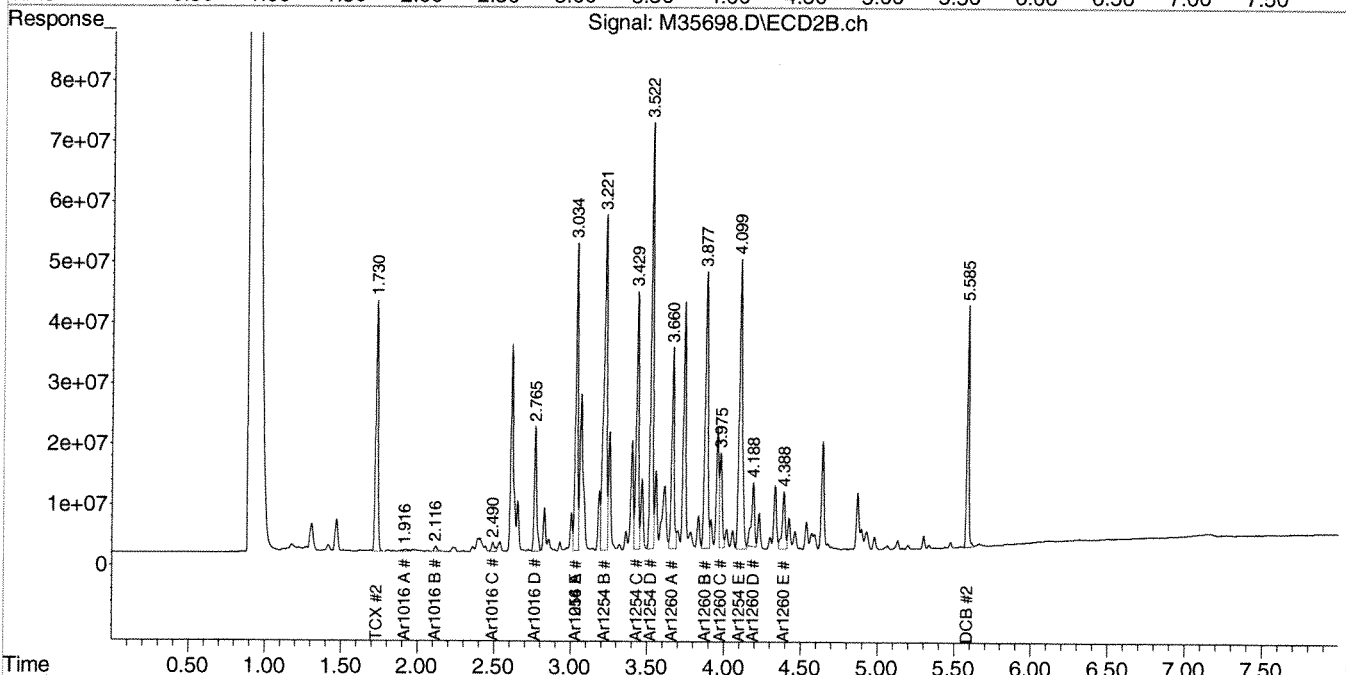
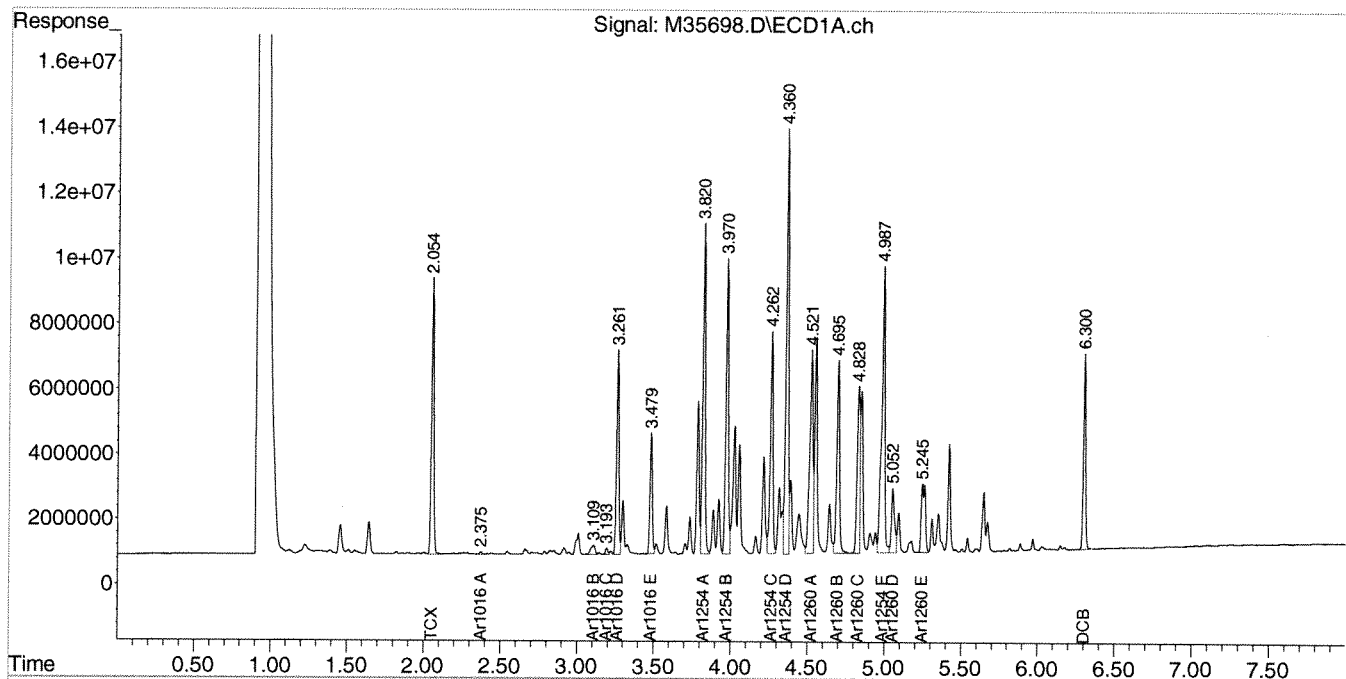
\* Values outside QC limits

Comments: \_\_\_\_\_

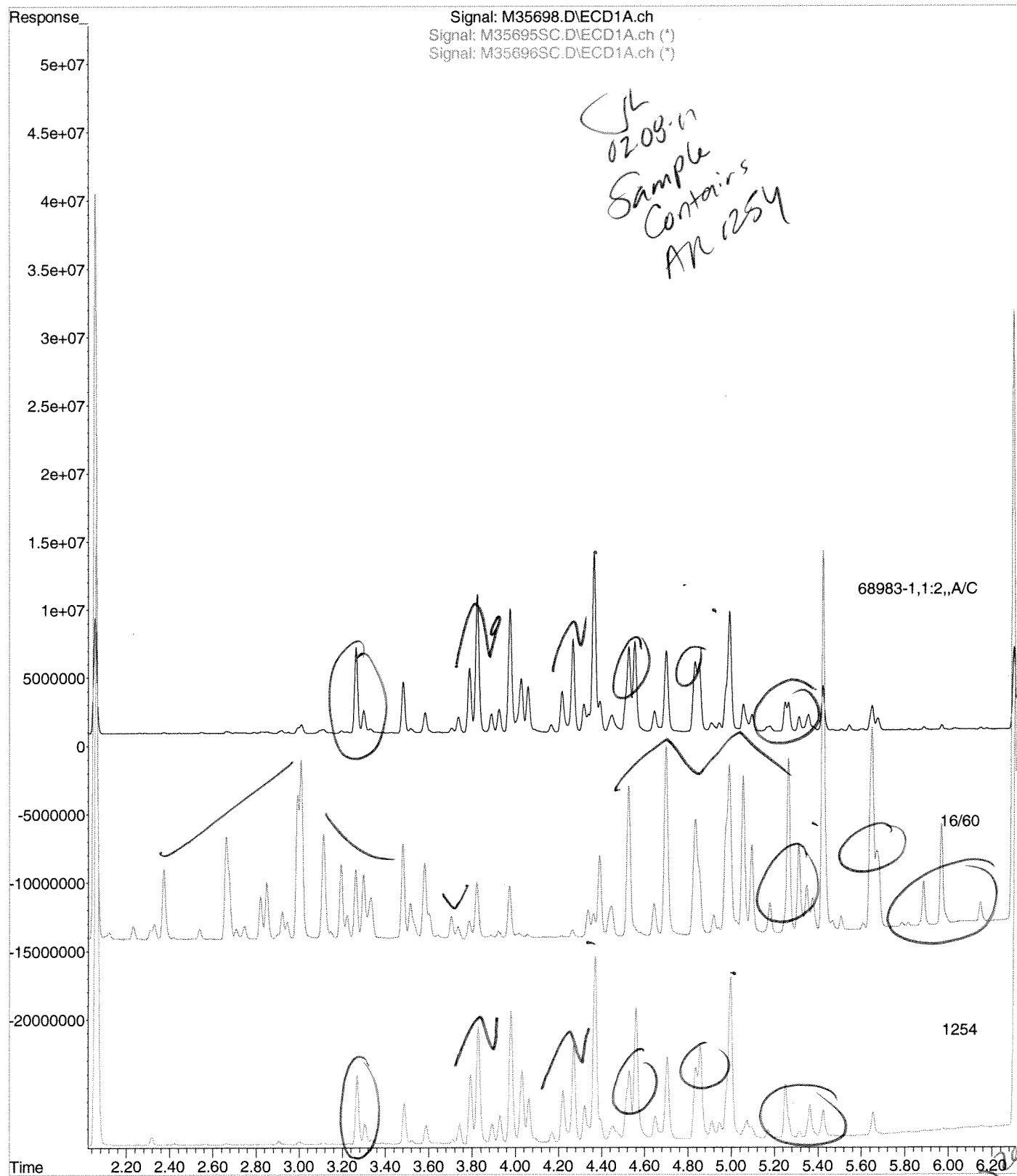
Data Path : C:\msdchem\1\DATA\020811-M\  
Data File : M35698.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 8 Feb 2011 9:42 am  
Operator : JK  
Sample : 68983-1,1:2,,A/C  
Misc : SOIL  
ALS Vial : 7 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Feb 08 10:27:12 2011  
Quant Method : C:\msdchem\1\METHODS\PCB020711.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Mon Feb 07 15:22:15 2011  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



File :C:\msdchem\1\DATA\020811-M\M35698.D  
Operator : JK  
Acquired : 8 Feb 2011 9:42 am using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: 68983-1,1:2,,A/C  
Misc Info : SOIL  
Vial Number: 7



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New Haven CT 06510

February 9, 2011

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL MOCK UP  
**Project Number:** 102010  
**Field Sample ID:** KCL 2-1-2

**Lab Sample ID:** 68983-2  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 1.0  
**Collection Date:** 02/01/11  
**Lab Receipt Date:** 02/04/11  
**Extraction Date:** 02/04/11  
**Analysis Date:** 02/07/11

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit $\mu\text{g/kg}$	Results $\mu\text{g/kg}$
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	<b>893</b>
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	89	%
Decachlorobiphenyl	71	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68983
GC Column #1: STX-CLPesticides I	Sample: 68983-2,,A/C
Column ID: 0.25 mm	Data File: M35663.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 1.0
Column ID: 0.25 mm	

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	893	842	5.9	

# Column to be used to flag RPD values greater than QC limit of 40%

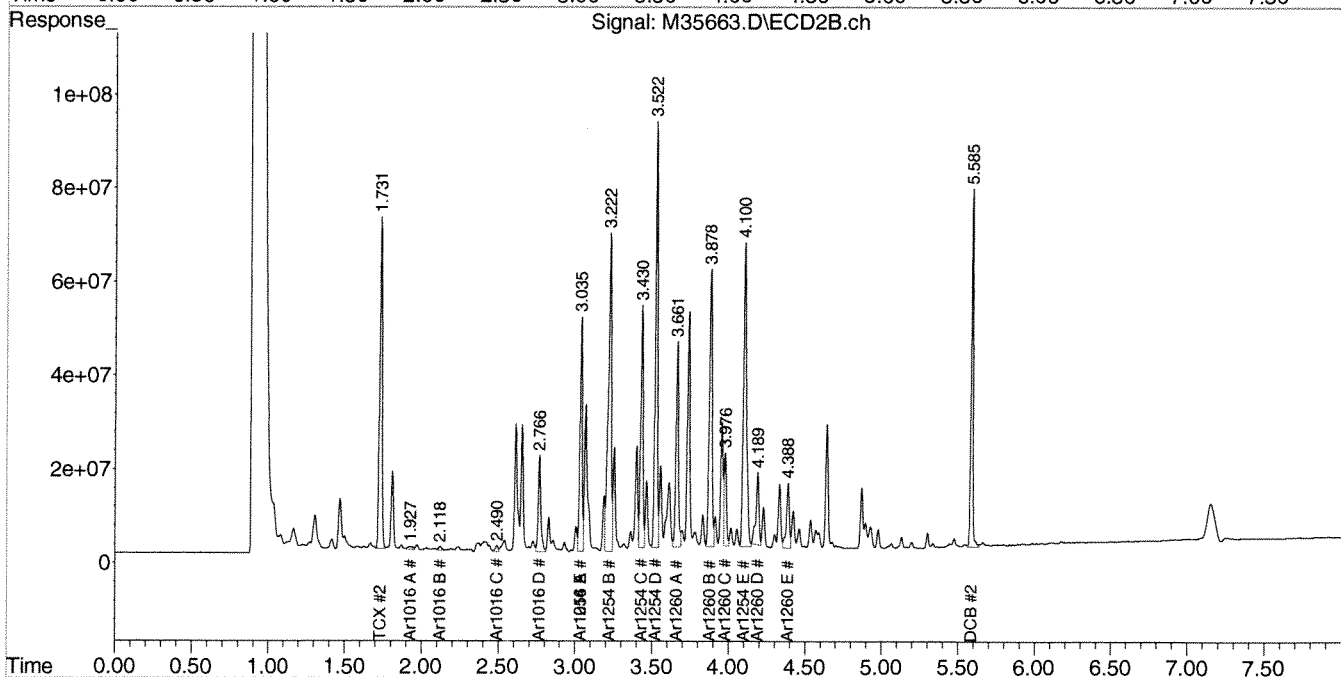
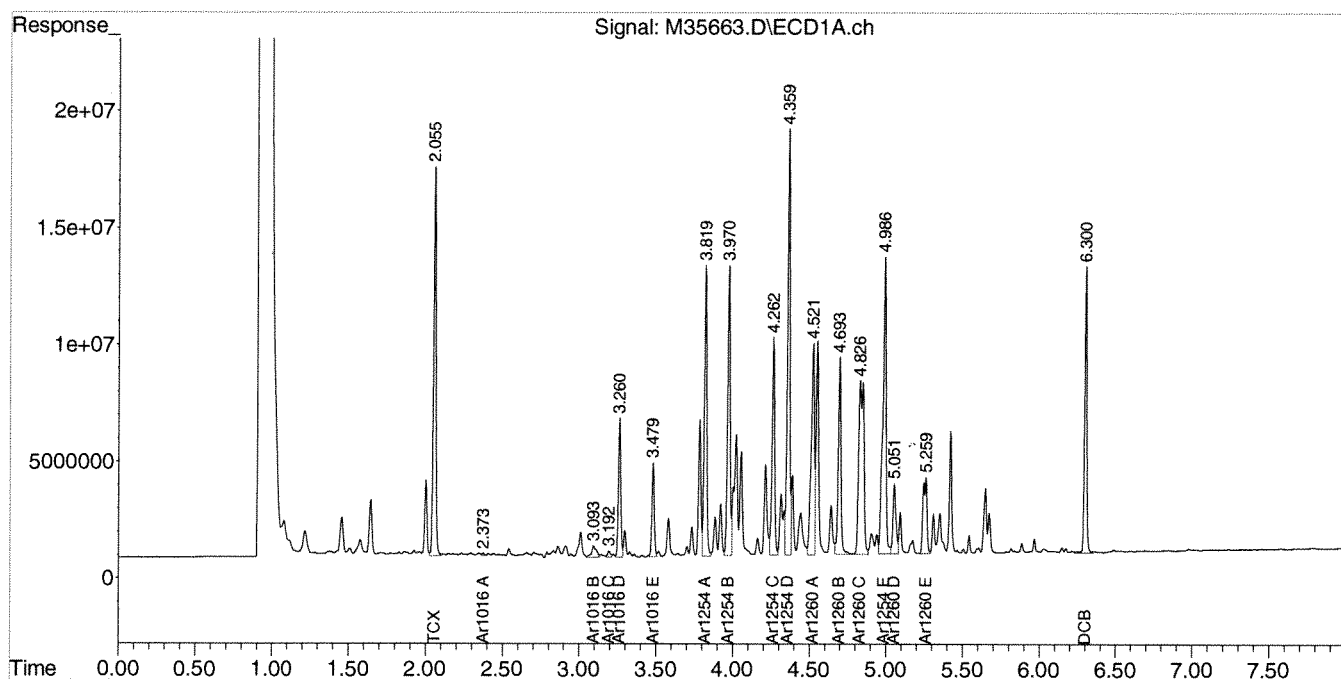
\* Values outside QC limits

Comments: \_\_\_\_\_

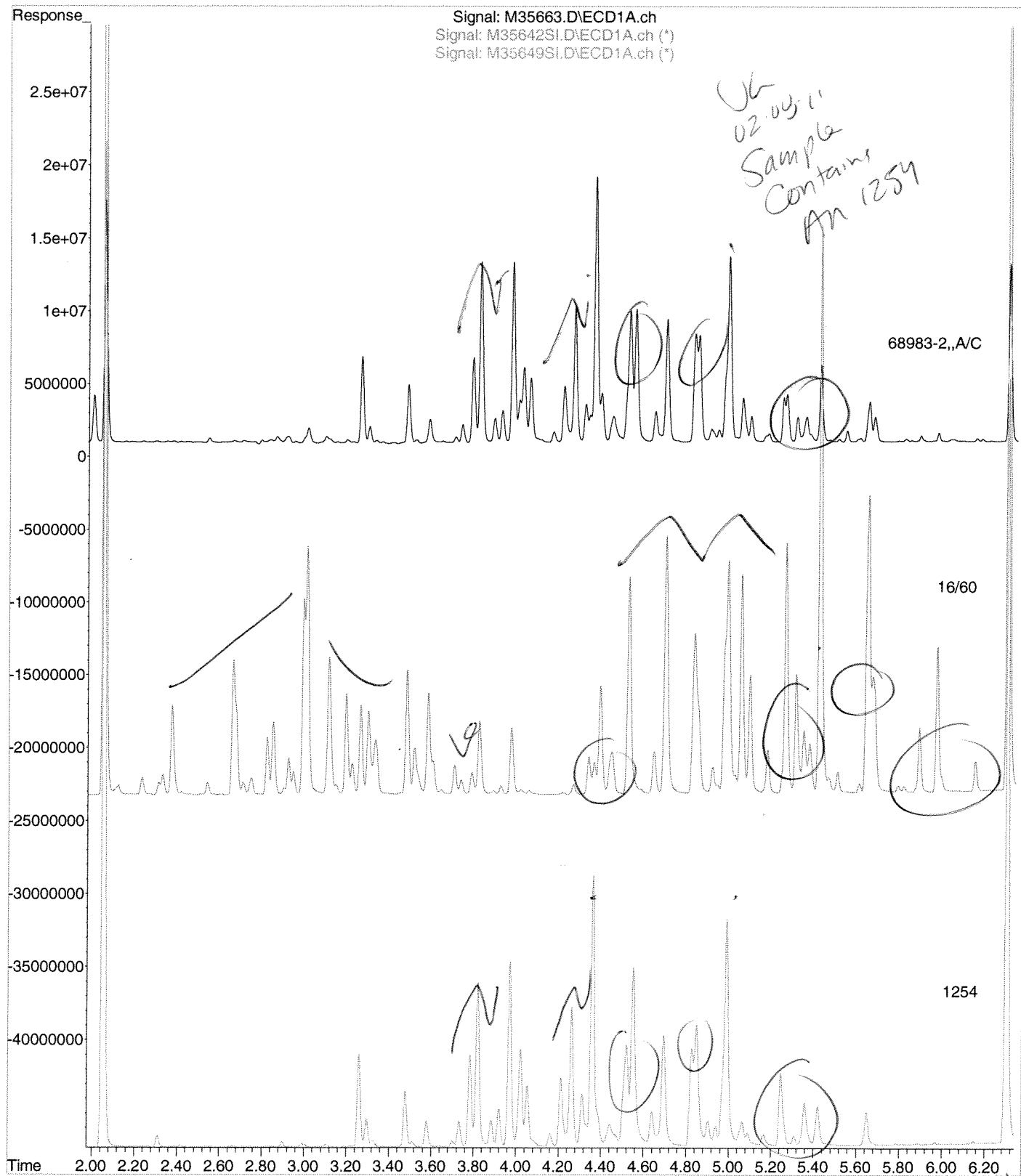
Data Path : C:\msdchem\1\DATA\020711-M\  
Data File : M35663.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 7 Feb 2011 5:25 pm  
Operator : JK  
Sample : 68983-2,,A/C  
Misc : SOIL  
ALS Vial : 10 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Feb 08 09:05:00 2011  
Quant Method : C:\msdchem\1\METHODS\PCB020711.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Mon Feb 07 15:27:39 2011  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



File :C:\msdchem\1\DATA\020711-M\M35663.D  
Operator : JK  
Acquired : 7 Feb 2011 5:25 pm using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: 68983-2,,A/C  
Misc Info : SOIL  
Vial Number: 10



Mr. Rob Klein  
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135 College Street  
New Haven CT 06510

February 9, 2011

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL MOCK UP  
**Project Number:** 102010  
**Field Sample ID:** KCL 2-1-3

**Lab Sample ID:** 68983-3  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 2.0  
**Collection Date:** 02/01/11  
**Lab Receipt Date:** 02/04/11  
**Extraction Date:** 02/04/11  
**Analysis Date:** 02/08/11

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit µg/kg	Results µg/kg
PCB-1016	66	U
PCB-1221	66	U
PCB-1232	66	U
PCB-1242	66	U
PCB-1248	66	U
PCB-1254	66	<b>1560</b>
PCB-1260	66	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	94	%
Decachlorobiphenyl	73	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.



PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M  
GC Column #1: STX-CLPesticides I  
Column ID: 0.25 mm  
GC Column #2: STX-CLPesticides II  
Column ID: 0.25 mm

SDG: 68983  
Sample: 68983-3,1:2,,A/C  
Data File: M35699.D  
Dilution Factor: 2.0

Column #1		Column #2		
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	#
PCB 1254	1446	1560	7.6	

# Column to be used to flag RPD values greater than QC limit of 40%

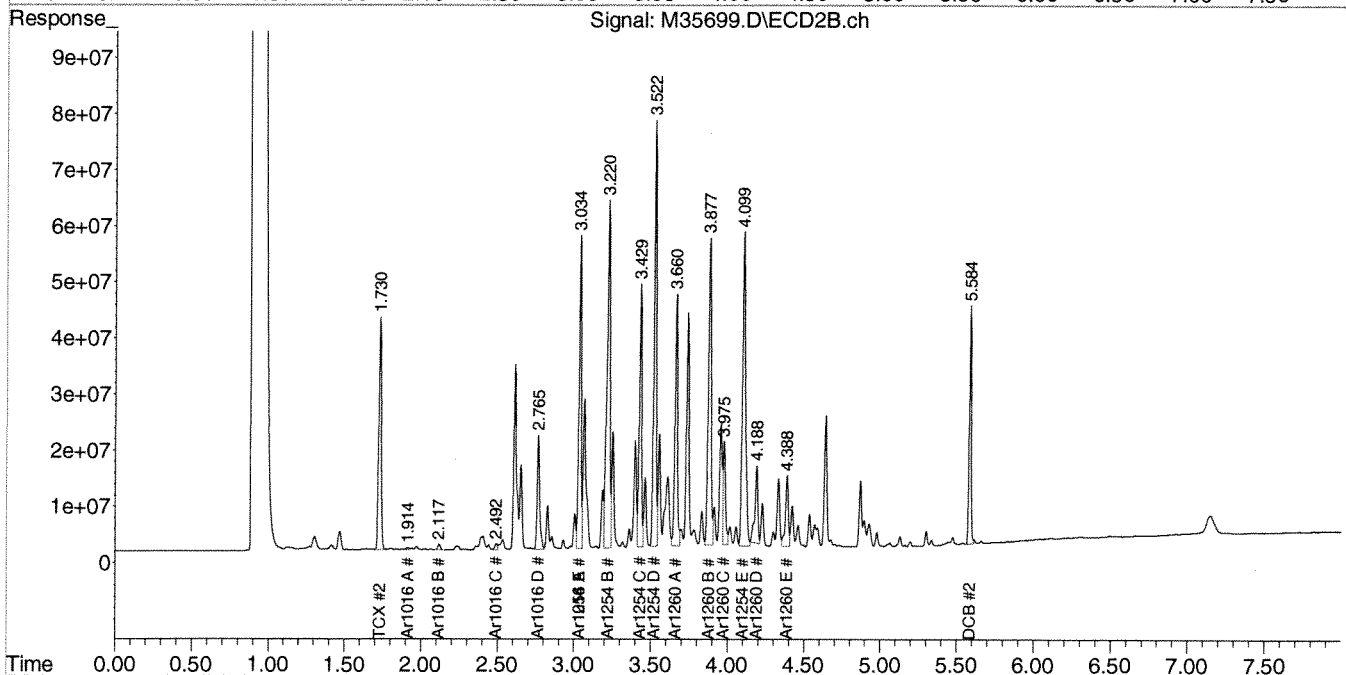
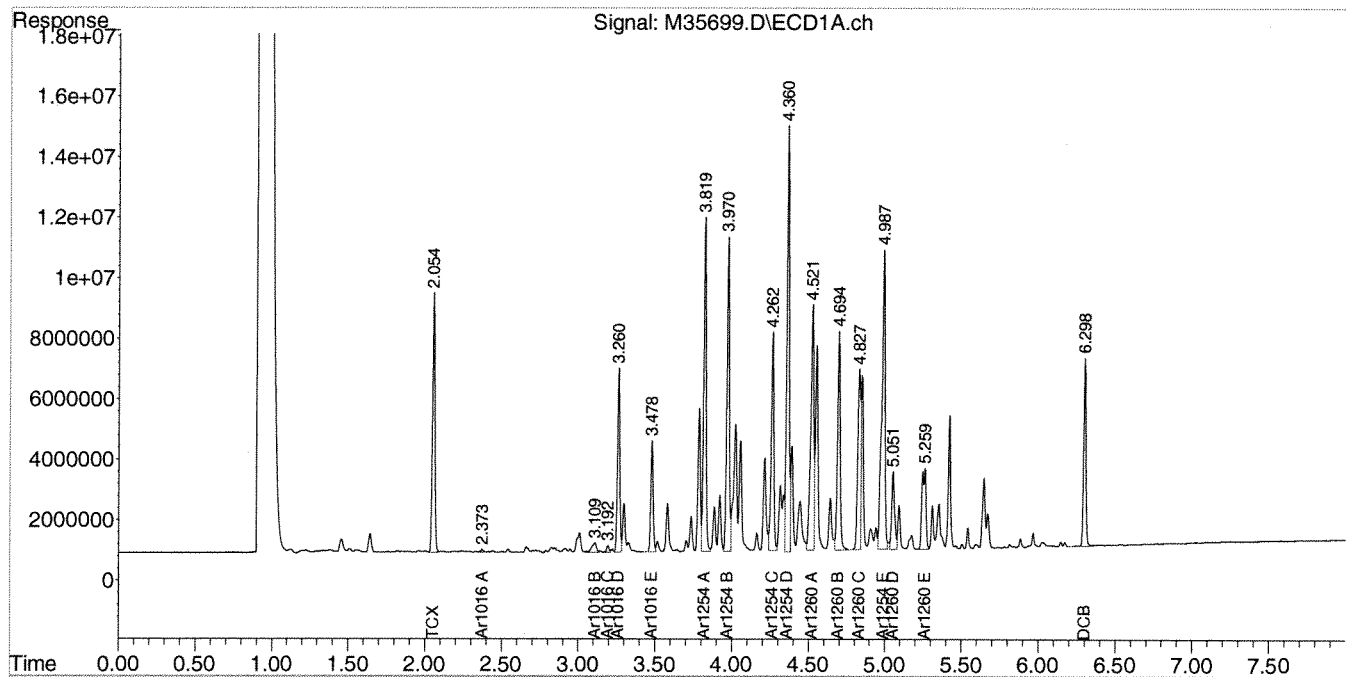
\* Values outside QC limits

Comments: \_\_\_\_\_

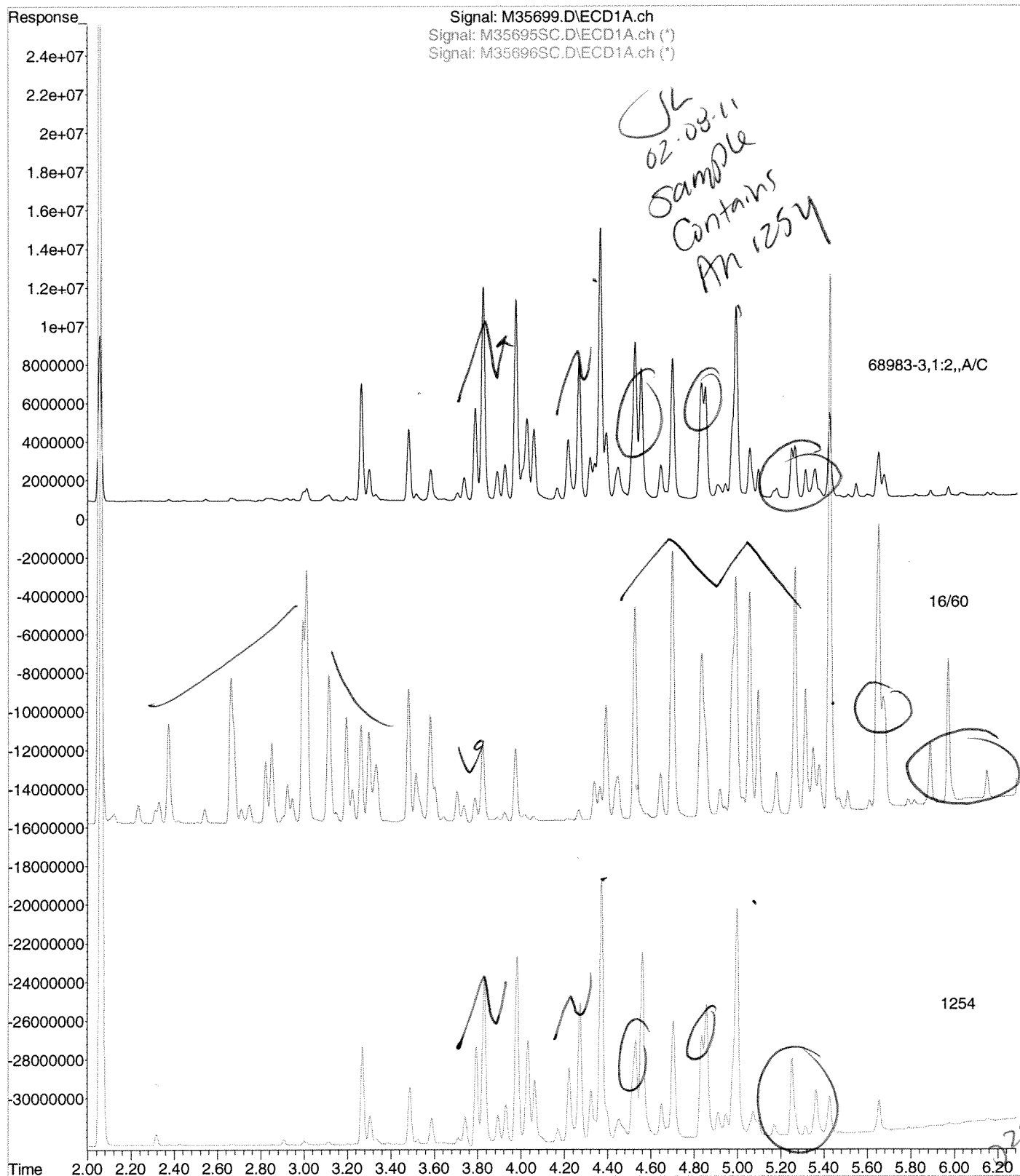
Data Path : C:\msdchem\1\DATA\020811-M\  
Data File : M35699.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 8 Feb 2011 9:52 am  
Operator : JK  
Sample : 68983-3,1:2,,A/C  
Misc : SOIL  
ALS Vial : 8 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Feb 08 10:28:21 2011  
Quant Method : C:\msdchem\1\METHODS\PCB020711.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Mon Feb 07 15:22:15 2011  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



File :C:\msdchem\1\DATA\020811-M\M35699.D  
Operator : JK  
Acquired : 8 Feb 2011 9:52 am using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: 68983-3,1:2,,A/C  
Misc Info : SOIL  
Vial Number: 8



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135 College Street  
New Haven CT 06510

February 9, 2011

**SAMPLE DATA**

**CLIENT SAMPLE ID**

**Project Name:** KCL MOCK UP  
**Project Number:** 102010  
**Field Sample ID:** KCL 2-1-4

**Lab Sample ID:** 68983-4  
**Matrix:** Solid  
**Percent Solid:** 99  
**Dilution Factor:** 1.0  
**Collection Date:** 02/01/11  
**Lab Receipt Date:** 02/04/11  
**Extraction Date:** 02/04/11  
**Analysis Date:** 02/07/11

**PCB ANALYTICAL RESULTS**

COMPOUND	Quantitation Limit µg/kg	Results µg/kg
PCB-1016	33	U
PCB-1221	33	U
PCB-1232	33	U
PCB-1242	33	U
PCB-1248	33	U
PCB-1254	33	<b>777</b>
PCB-1260	33	U
<b><u>Surrogate Standard Recovery</u></b>		
2,4,5,6-Tetrachloro-m-xylene	93	%
Decachlorobiphenyl	73	%
U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in		

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

Sample preparation conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 3540C.

COMMENTS: Results are expressed on a dry weight basis.

PCB  
COLUMN RELATIVE PERCENT DIFFERENCE

Instrument ID: M	SDG: 68983
GC Column #1: STX-CLPesticides I	Sample: 68983-4,,A/C
Column ID: 0.25 mm	Data File: M35665.D
GC Column #2: STX-CLPesticides II	Dilution Factor: 1.0
Column ID: 0.25 mm	

Column #1		Column #2		#
COMPOUND	SAMPLE RESULT (ug/kg)	SAMPLE RESULT (ug/kg)	RPD	
PCB 1254	777	770	1.0	

# Column to be used to flag RPD values greater than QC limit of 40%

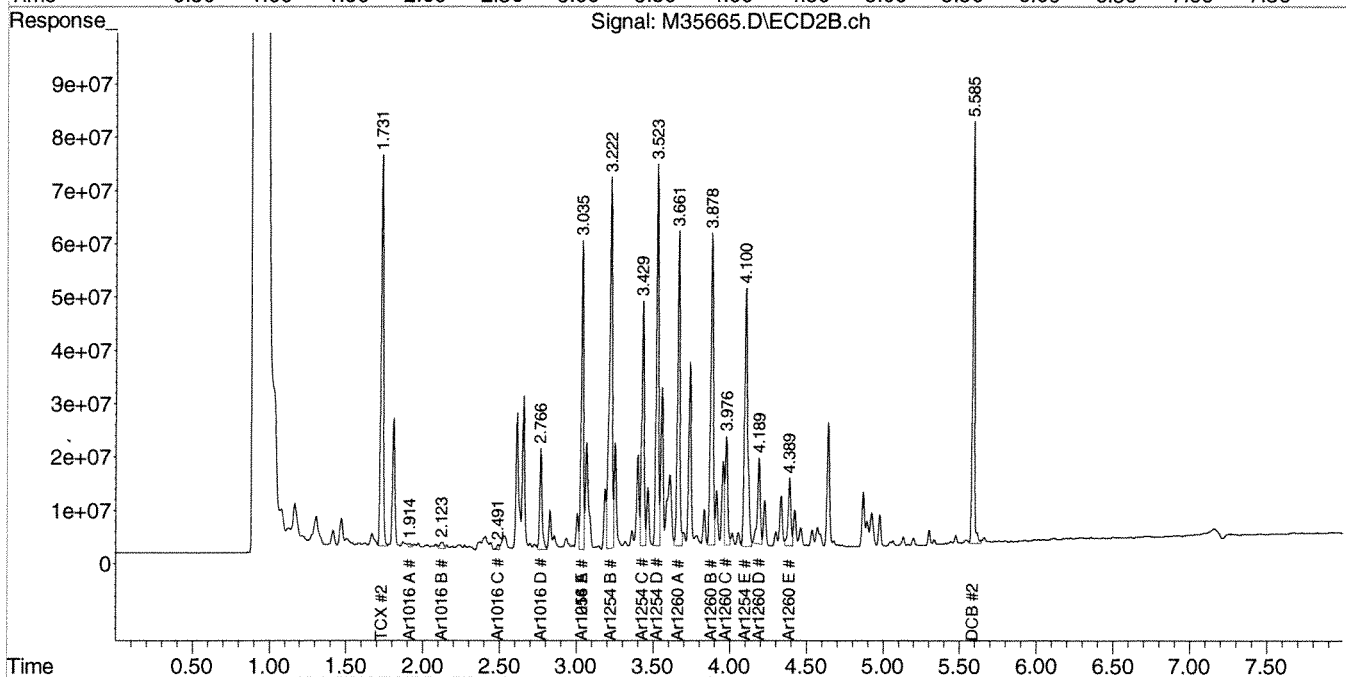
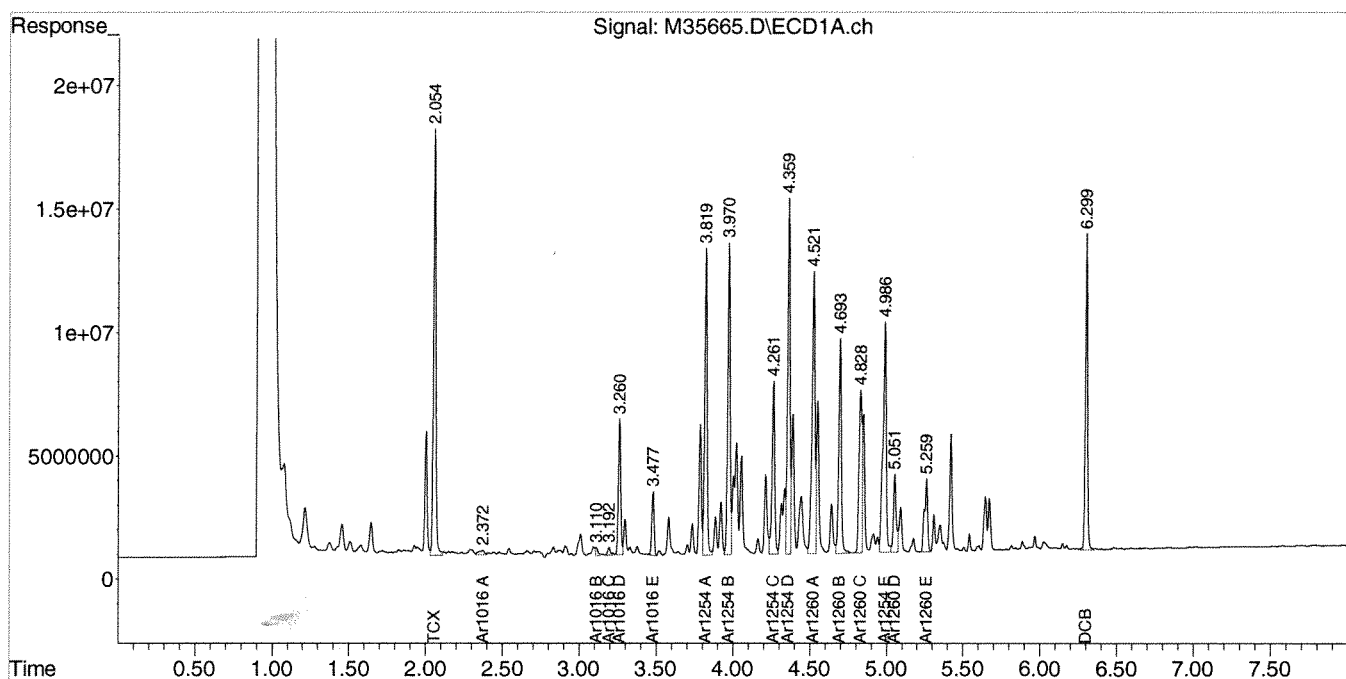
\* Values outside QC limits

Comments: \_\_\_\_\_

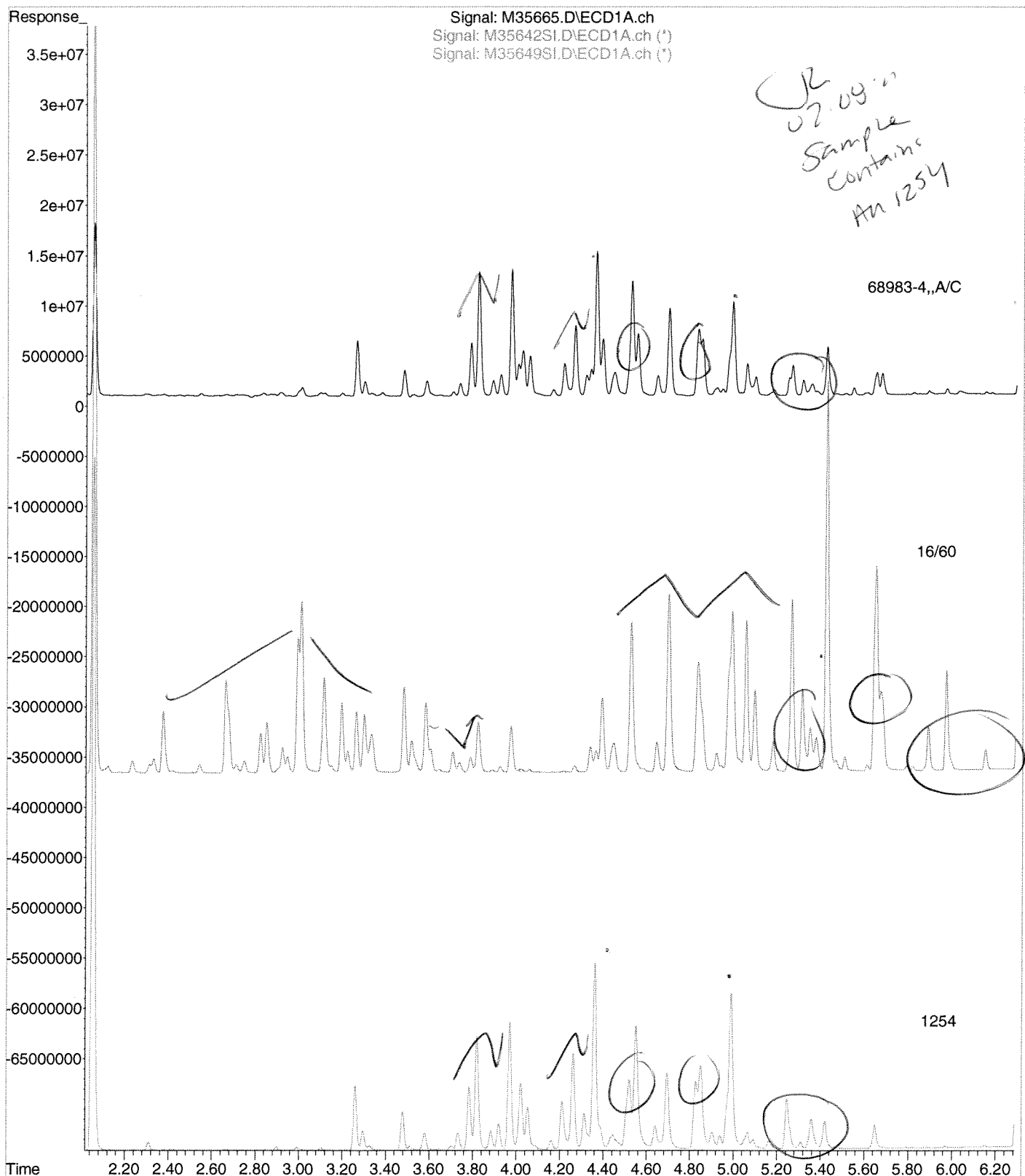
Data Path : C:\msdchem\1\DATA\020711-M\  
Data File : M35665.D  
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch  
Acq On : 7 Feb 2011 5:45 pm  
Operator : JK  
Sample : 68983-4,,A/C  
Misc : SOIL  
ALS Vial : 12 Sample Multiplier: 1

Integration File signal 1: events.e  
Integration File signal 2: events2.e  
Quant Time: Feb 08 09:06:25 2011  
Quant Method : C:\msdchem\1\METHODS\PCB020711.M  
Quant Title : SW-846 METHOD 8082 Aroclor 1016/1260/1254  
QLast Update : Mon Feb 07 15:27:39 2011  
Response via : Initial Calibration  
Integrator: ChemStation

Volume Inj. : 2 uL  
Signal #1 Phase : STX-CLPPesticides Signal #2 Phase: STX-CLPPesticides  
Signal #1 Info : 30 m x 0.25mm x 0 Signal #2 Info : 30 m x 0.25mm x 0.25 um



File :C:\msdchem\1\DATA\020711-M\M35665.D  
Operator : JK  
Acquired : 7 Feb 2011 5:45 pm using AcqMethod PEST.M  
Instrument : Instrument M  
Sample Name: 68983-4,,A/C  
Misc Info : SOIL  
Vial Number: 12



## PCB QC FORMS





# PCB SOIL SYSTEM MONITORING COMPOUNDS SUMMARY

Instrument ID: M  
GC Column #1: STX-CLPesticides I  
Column ID: 0.25 mm  
GC Column #2: STX-CLPesticides II  
Column ID: 0.25 mm

SDG: 68983

[illegible]

	Lower Limit	Upper Limit
SMC #1 = TCX	40	130
SMC #2 = DCB	40	130

# Column to be used to flag recovery values outside of QC limits  
\* Values outside QC limits  
D System Monitoring Compound diluted out

PCB SOIL  
LABORATORY CONTROL SAMPLE/DUPLICATE  
PERCENT RECOVERY

Instrument ID: M

GC Column #1: STX-CLPesticides I

Column ID: 0.25 mm

GC Column #2: STX-CLPesticides II

Column ID: 0.25 mm

SDG: 68983

Non-spiked sample: B020411PSOX,,A/C

Spike: L020411PSOX,,A/C

Spike duplicate: LD020411PSOX,,A/C

	LCS SPIKE	LCSD SPIKE	LOWER	UPPER	RPD	NON-SPIKE	SPIKE	SPIKE		SPIKE DUP		SPIKE DUP			
COMPOUND	ADDED (ug/kg)	ADDED (ug/kg)	LIMIT	LIMIT	LIMIT	RESULT (ug/kg)	RESULT (ug/kg)	% REC	#	RESULT (ug/kg)	% REC	#	RPD	#	
PCB 1016	200	200	65	140	30	0	191	95		199	100		4.3		
PCB 1260	200	200	60	130	30	0	181	90		182	91		1.0		
PCB 1016 #2	200	200	65	140	30	0	169	85		172	86		1.5		
PCB 1260 #2	200	200	60	130	30	0	183	91		185	93		1.5		

# Column to be used to flag recovery and RPD values outside of QC limits

\* Values outside QC limits

LCS/LCSD spike added values have been weight adjusted.

Non-spike result of "0" used in place of "U" to allow calculation of spike recovery.

Comments: \_\_\_\_\_  
\_\_\_\_\_

## CHAIN OF CUSTODIES

# Chain Of Custody Form

<b>analytical environmental laboratory LLC</b> 195 Commerce Way Suite E Portsmouth, NH 03801 Phone (603) 436-5111 Fax (603) 430-2151		Project#: 102010 Proj. Name: KCL Mack R Company: YARE EHS Contact: STEVE MANDRA / ROB KLEIN Address: 135 COLLEGE ST, STE 100 NEW HAVEN, CT 06510 Phone 203 737 4453		Matrix Key: C = Concrete WP = Wipe WW = Wastewater SW = Surface Water GW = Groundwater DW = Drinking Water S = Soil/Sludge O = Oil E = Extract X = Other		Preservation P = plastic G = glass		Container Key Container number/type Matrix Other Methanol HCL H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> Ac Unpres		pH Analytics Sample # 68983 -1 2 3 4		Date: 2/1/11 Time: 11 AM Received By: [Signature] Date: 2/4/11 Time: 10:15 Received By: [Signature]	
Samples were: 1) Shipped or hand-delivered 2) Temp blank °C 9.9°C 3) Received in good condition Y <input checked="" type="checkbox"/> N 4) pH checked by: N/A 5) Labels checked by: JWC 2.4.11		State: NH Report Type: <input checked="" type="checkbox"/> MCP <input type="checkbox"/> Level II <input type="checkbox"/> Level III <input checked="" type="checkbox"/> Level IV CTRC <input type="checkbox"/> DOD <input type="checkbox"/> Standard State Standard: (eg. S-1 or GW-1) EDD Required: Y* N Type: —		Project Requirements: State: NH Report Type: <input checked="" type="checkbox"/> MCP <input type="checkbox"/> Level II <input type="checkbox"/> Level III <input checked="" type="checkbox"/> Level IV CTRC <input type="checkbox"/> DOD <input type="checkbox"/> Standard State Standard: (eg. S-1 or GW-1) EDD Required: Y* N Type: —		Comments / Instructions: Email Results to: rob.klein@yale.edu Turnaround Request: <input checked="" type="checkbox"/> Priority <input type="checkbox"/> Standard Due Date: <input type="checkbox"/> Due Date: <input type="checkbox"/>		Quotations YMC 9101501 Station IDs are 'KCL 2-1...' all containers going by OX unless					

otherwise stated by client - CP 2/4/11  
- Please go by container labels not CXC for sample names + proceed w/ analysis as per Store 110224 - CP 2/4/11

ANALYTICS SAMPLE RECEIPT CHECKLIST

AEL LAB#: 68983 COOLER NUMBER: Client cooler  
 CLIENT: Kale NUMBER OF COOLERS: 1  
 PROJECT: KCL Mock up DATE RECEIVED: 2/4/11

**A: PRELIMINARY EXAMINATION:**

1. Cooler received by (initials): CP  
 2. Circle one: Hand delivered (If so, skip 3) Shipped  
 3. Did cooler come with a shipping slip? Y N  
 3a. Enter carrier name and airbill number here: \_\_\_\_\_  
 4. Were custody seals on the outside of cooler? Y N  
 How many & where: \_\_\_\_\_ Seal Date: \_\_\_\_\_ Seal Name: \_\_\_\_\_  
 5. Did the custody seals arrive unbroken and intact upon arrival? Y N/A  
 6. COC#: N/A  
 7. Were Custody papers filled out properly (ink, signed, etc)? Y N  
 8. Were custody papers sealed in a plastic bag? Y N  
 9. Did you sign the COC in the appropriate place? Y N  
 10. Was the project identifiable from the COC papers? Y N  
 11. Was enough ice used to chill the cooler? Y N Temp. of cooler: 9.9°

**B. Log-In:** Date samples were logged in: 2/4/11

By: CP  
 12. Type of packing in cooler (bubble wrap, popcorn) Y N  
 13. Were all bottles sealed in separate plastic bags? Y N  
 14. Did all bottles arrive unbroken and were labels in good condition? Y N  
 15. Were all bottle labels complete (ID, Date, time, etc.)? Y N  
 16. Did all bottle labels agree with custody papers? Y N  
 17. Were the correct containers used for the tests indicated? Y N  
 18. Were samples received at the correct pH? Y N/A  
 19. Was sufficient amount of sample sent for the tests indicated? Y N  
 20. Were all samples submitted within holding time? Y N  
 21. Were bubbles absent in VOA samples? Y N/A

If NO, List Sample ID's and Lab #s: \_\_\_\_\_

22. Laboratory labeling verified by (initials): su Date: 2.4.11

*No Sampler signature, No sample times listed on COC*  
*No times or dates on labels*  
*Sample labels all state "KCL 2-1-11" going by COC unless otherwise specified by client*  
*go by container labels not COC as per Steve Mordzia over phone 2/4*

**SAMPLE RECEIPT  
NON-COMPLIANCE NOTIFICATION  
(SENT VIA FACSIMILE)**

DATE 2/4/11

FROM \_\_\_\_\_

FAX CONTACT Rob Klein/Steve Mordzia

FAX NUMBER 203-785-1588

CLIENT YALE

LAB NUMBER 68983

The exceptions noted below were found on the sample(s) received on the attached Chain of Custody (COC) form. These exceptions may render the data results as non-defensible. Analytics will continue to proceed with the analysis of the sample(s) unless notified in writing to stop the analysis. This document may become part of the final report.

Please check the appropriate box and sign below and fax back to "Sample Receipt" at 603-430-2151.

**Exceptions:**

☒ Sample(s) not on ice or not at  $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$  → Samples @  $9.9^{\circ}\text{C}$

☐ Sample(s) received unpreserved or not at the proper pH.  
(pH was adjusted at the laboratory)

☐ Sample(s) received in incorrect containers

☐ Insufficient sample volume received  
(Detection limits may be elevated due to this exception)

☐ Trip Blank provided in cooler, but not recorded on the chain of custody

☒ Other: Sample names on containers all state "KCL 2-1..." which does not match COC, AEL to go by COC for sample name unless otherwise stated by client

**Acknowledgment:**

☐ Please do not analyze/report Trip Blank, proceed with other analyses

☒ Proceed with the analysis. - use container labels as sample names, not COC as per S. Mordzia over phone

☐ Please stop the analysis and wait for further instructions.

Signed: Steve Mordzia

Print Name: Steve Mordzia

Date: 2/4/11

From: (203) 737-2122  
Stephanie Perry  
Yale University  
135 College St

Origin ID: EFBA

**FedEx**  
Express



J1110101220225

New Haven, CT 06510

Ship Date: 02FEB11  
ActWgt: 7.5 LB  
CAD: 6271659/WBUS0200

Dims: 13 X 13 X 13 IN

Delivery Address Bar Code



SHIP TO: (603) 436-5111

BILL SENDER

**Analytics Environmental Laboratory**  
195 Commerce Way  
Suite E  
Portsmouth, NH 03801

Ref #  
Invoice #  
PO #  
Dept #

THU - 03 FEB A2

FRI - 04 FEB A2

**STANDARD OVERNIGHT**

DSR

**03801**

NH-US

**MHT**

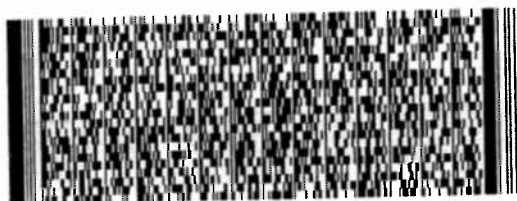
**FedEx**

TRK# 7967 2022 4135  
0201

**03 IGGA**



Emp# 313921 03FEB11 HVNA 50AC1/02C2/183F





April 6, 2012

George Franklin  
Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810

Project Location: Yale KCL  
Client Job Number:  
Project Number: 225540  
Laboratory Work Order Number: 12C0993

Enclosed are results of analyses for samples received by the laboratory on March 30, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley  
Project Manager

Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810  
ATTN: George Franklin

REPORT DATE: 4/6/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 225540

# ANALYTICAL SUMMARY

WORK ORDER NUMBER: 12C0993

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Yale KCL

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
KCL-CBK-001	12C0993-01	Caulk		SW-846 8082A	
KCL-CBK-002	12C0993-02	Caulk		SW-846 8082A	
KCL-CBK-003	12C0993-03	Caulk		SW-846 8082A	
KCL-CBK-004	12C0993-04	Caulk		SW-846 8082A	
KCL-CBK-005	12C0993-05	Caulk		SW-846 8082A	
KCL-CBK-006	12C0993-06	Caulk		SW-846 8082A	
KCL-CBK-007	12C0993-07	Caulk		SW-846 8082A	
KCL-CBK-008	12C0993-08	Caulk		SW-846 8082A	
KCL-CBK-012	12C0993-09	Caulk		SW-846 8082A	
KCL-CBK-013	12C0993-10	Caulk		SW-846 8082A	
KCL-CBK-014	12C0993-11	Caulk		SW-846 8082A	
KCL-CBC-015	12C0993-12	Concrete		SW-846 8082A	
KCL-CBC-016	12C0993-13	Concrete		SW-846 8082A	
KCL-CBK-017	12C0993-14	Caulk		SW-846 8082A	
KCL-CBK-018	12C0993-15	Caulk		SW-846 8082A	
KCL-CBB-019	12C0993-16	Concrete		SW-846 8082A	
KCL-CBB-020	12C0993-17	Concrete		SW-846 8082A	
KCL-CBB-022	12C0993-18	Concrete		SW-846 8082A	
KCL-CBR-024	12C0993-19	Concrete		SW-846 8082A	
KCL-CBK-025	12C0993-20	Caulk		SW-846 8082A	
KCL-CBB-027	12C0993-21	Concrete		SW-846 8082A	
KCL-CBR-029	12C0993-22	Concrete		SW-846 8082A	
KCL-CBB-030	12C0993-23	Concrete		SW-846 8082A	
KCL-CBB-031	12C0993-24	Concrete		SW-846 8082A	
KCL-CBK-032	12C0993-25	Caulk		SW-846 8082A	
KCL-CBR-033	12C0993-26	Concrete		SW-846 8082A	
KCL-CBR-035	12C0993-27	Concrete		SW-846 8082A	
KCL-CBKD-040	12C0993-30	Concrete		SW-846 8082A	
KCL-CBBD-041	12C0993-31	Concrete		SW-846 8082A	
KCL-CBBQ-042	12C0993-32	Equipment Blank Water		SW-846 8082A	

## CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

**SW-846 8082A**

### Qualifications:

Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.

### Analyte & Samples(s) Qualified:

**Aroclor-1016, Aroclor-1016 [2C], Aroclor-1260, Aroclor-1260 [2C]**

B048908-MS1, B048908-MSD1

Due to continuing calibration non-conformance on the confirmatory detector, the lower of two results was reported.

### Analyte & Samples(s) Qualified:

**Aroclor-1254 [2C]**

12C0993-29[KCL-CBR-039], 12C0993-31[KCL-CBBD-041]

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

### Analyte & Samples(s) Qualified:

**Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C]**

12C0993-01[KCL-CBK-001], 12C0993-02[KCL-CBK-002], 12C0993-04[KCL-CBK-004], 12C0993-05[KCL-CBK-005], 12C0993-06[KCL-CBK-006], 12C0993-09[KCL-CBK-012], 12C0993-10[KCL-CBK-013], 12C0993-11[KCL-CBK-014], 12C0993-14[KCL-CBK-017], 12C0993-15[KCL-CBK-018], 12C0993-20[KCL-CBK-025], 12C0993-25[KCL-CBK-032], [REDACTED] 12C0993-30[KCL-CBKD-040]

Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side.

### Analyte & Samples(s) Qualified:

**Aroclor-1016**

B048990-BS1, B048990-BSD1

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

### Analyte & Samples(s) Qualified:

**Aroclor-1016**

B048990-BS1, B048990-BSD1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Daren J. Damboragian", is written over a light gray rectangular background.

Daren J. Damboragian  
Laboratory Manager

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-001

Sampled: 3/29/2012 09:50

Sample ID: 12C0993-01

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1221 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1232 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1242 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1248 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1254 [1]	400000	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1260 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1262 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Aroclor-1268 [1]	ND	47000	mg/Kg	250000		SW-846 8082A	4/2/12	4/5/12 10:19	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 10:19	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 10:19	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 10:19	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 10:19	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-002

Sampled: 3/29/2012 10:10

Sample ID: 12C0993-02

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1221 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1232 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1242 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1248 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1254 [1]	33	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1260 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1262 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Aroclor-1268 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:15	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 9:15	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 9:15	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 9:15	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 9:15	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-003

Sampled: 3/29/2012 10:12

Sample ID: 12C0993-03

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1221 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1232 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1242 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1248 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1254 [1]	2.0	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1260 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1262 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Aroclor-1268 [1]	ND	0.89	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:27	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	82.1	30-150						4/5/12 9:27	
Decachlorobiphenyl [2]	78.7	30-150						4/5/12 9:27	
Tetrachloro-m-xylene [1]	113	30-150						4/5/12 9:27	
Tetrachloro-m-xylene [2]	112	30-150						4/5/12 9:27	

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-004

Sampled: 3/29/2012 10:15

Sample ID: 12C0993-04

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1221 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1232 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1242 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1248 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1254 [1]	490000	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1260 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1262 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Aroclor-1268 [1]	ND	35000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 13:33	PJG
Surrogates	% Recovery		Recovery Limits		Flag				
Decachlorobiphenyl [1]	*		30-150		S-01		4/5/12 13:33		
Decachlorobiphenyl [2]	*		30-150		S-01		4/5/12 13:33		
Tetrachloro-m-xylene [1]	*		30-150		S-01		4/5/12 13:33		
Tetrachloro-m-xylene [2]	*		30-150		S-01		4/5/12 13:33		



Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-005

Sampled: 3/29/2012 10:18

Sample ID: 12C0993-05

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1221 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1232 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1242 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1248 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1254 [1]	67	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1260 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1262 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Aroclor-1268 [1]	ND	10	mg/Kg	50		SW-846 8082A	4/2/12	4/5/12 9:40	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 9:40	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 9:40	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 9:40	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 9:40	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-006

Sampled: 3/29/2012 10:20

Sample ID: 12C0993-06

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1221 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1232 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1242 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1248 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1254 [1]	360	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1260 [2]	370	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1262 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Aroclor-1268 [1]	ND	90	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 21:49	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/4/12 21:49	
Decachlorobiphenyl [2]	*	30-150			S-01			4/4/12 21:49	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/4/12 21:49	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/4/12 21:49	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-007

Sampled: 3/29/2012 10:45

Sample ID: 12C0993-07

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1221 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1232 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1242 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1248 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1254 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1260 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1262 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Aroclor-1268 [1]	ND	0.95	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 9:53	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	85.5	30-150						4/5/12 9:53	
Decachlorobiphenyl [2]	85.6	30-150						4/5/12 9:53	
Tetrachloro-m-xylene [1]	108	30-150						4/5/12 9:53	
Tetrachloro-m-xylene [2]	109	30-150						4/5/12 9:53	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-008

Sampled: 3/29/2012 10:48

Sample ID: 12C0993-08

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1221 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1232 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1242 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1248 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1254 [1]	1.4	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1260 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1262 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Aroclor-1268 [1]	ND	0.94	mg/Kg	5		SW-846 8082A	4/2/12	4/5/12 10:06	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	90.4	30-150							
Decachlorobiphenyl [2]	90.6	30-150							
Tetrachloro-m-xylene [1]	115	30-150							
Tetrachloro-m-xylene [2]	114	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-012

Sampled: 3/29/2012 11:35

Sample ID: 12C0993-09

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1221 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1232 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1242 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1248 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1254 [1]	49	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1260 [2]	18	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1262 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Aroclor-1268 [1]	ND	9.8	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:28	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	*	30-150	S-01					4/4/12 22:28	
Decachlorobiphenyl [2]	*	30-150	S-01					4/4/12 22:28	
Tetrachloro-m-xylene [1]	*	30-150	S-01					4/4/12 22:28	
Tetrachloro-m-xylene [2]	*	30-150	S-01					4/4/12 22:28	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-013

Sampled: 3/29/2012 11:38

Sample ID: 12C0993-10

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1221 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1232 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1242 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1248 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1254 [1]	55	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1260 [2]	20	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1262 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Aroclor-1268 [1]	ND	9.6	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 22:41	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	*	30-150	S-01					4/4/12 22:41	
Decachlorobiphenyl [2]	*	30-150	S-01					4/4/12 22:41	
Tetrachloro-m-xylene [1]	*	30-150	S-01					4/4/12 22:41	
Tetrachloro-m-xylene [2]	*	30-150	S-01					4/4/12 22:41	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-014

Sampled: 3/29/2012 11:58

Sample ID: 12C0993-11

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1221 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1232 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1242 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1248 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1254 [1]	1900	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1260 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1262 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Aroclor-1268 [1]	ND	96	mg/Kg	500		SW-846 8082A	4/2/12	4/4/12 22:54	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/4/12 22:54	
Decachlorobiphenyl [2]	*	30-150			S-01			4/4/12 22:54	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/4/12 22:54	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/4/12 22:54	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBC-015

Sampled: 3/29/2012 12:10

Sample ID: 12C0993-12

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1254 [1]	3.8	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:13	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	85.3	30-150						4/2/12 16:13	
Decachlorobiphenyl [2]	89.4	30-150						4/2/12 16:13	
Tetrachloro-m-xylene [1]	92.9	30-150						4/2/12 16:13	
Tetrachloro-m-xylene [2]	84.1	30-150						4/2/12 16:13	



Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBC-016

Sampled: 3/29/2012 12:20

Sample ID: 12C0993-13

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1254 [1]	2.2	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:25	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	96.1	30-150						4/2/12 16:25	
Decachlorobiphenyl [2]	100	30-150						4/2/12 16:25	
Tetrachloro-m-xylene [1]	101	30-150						4/2/12 16:25	
Tetrachloro-m-xylene [2]	95.1	30-150						4/2/12 16:25	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-017

Sampled: 3/29/2012 12:50

Sample ID: 12C0993-14

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1221 [1]	ND	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1232 [1]	ND	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1242 [1]	ND	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1248 [2]	8.9	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1254 [1]	27	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1260 [2]	23	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1262 [1]	ND	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Aroclor-1268 [1]	ND	8.7	mg/Kg	50		SW-846 8082A	4/2/12	4/4/12 23:06	PJG
Surrogates	% Recovery		Recovery Limits		Flag				
Decachlorobiphenyl [1]	*		30-150		S-01		4/4/12 23:06		
Decachlorobiphenyl [2]	*		30-150		S-01		4/4/12 23:06		
Tetrachloro-m-xylene [1]	*		30-150		S-01		4/4/12 23:06		
Tetrachloro-m-xylene [2]	*		30-150		S-01		4/4/12 23:06		

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-018

Sampled: 3/29/2012 13:05

Sample ID: 12C0993-15

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1221 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1232 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1242 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1248 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1254 [1]	390000	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1260 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1262 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Aroclor-1268 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:45	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 10:45	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 10:45	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 10:45	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 10:45	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBB-019

Sampled: 3/29/2012 13:15

Sample ID: 12C0993-16

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1254 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:37	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	90.9	30-150							
Decachlorobiphenyl [2]	95.0	30-150							
Tetrachloro-m-xylene [1]	92.3	30-150							
Tetrachloro-m-xylene [2]	86.2	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBB-020

Sampled: 3/29/2012 13:25

Sample ID: 12C0993-17

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1221 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1232 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1242 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1248 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1254 [1]	0.64	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1260 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1262 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Aroclor-1268 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 16:50	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	93.9	30-150						4/2/12 16:50	
Decachlorobiphenyl [2]	98.3	30-150						4/2/12 16:50	
Tetrachloro-m-xylene [1]	98.8	30-150						4/2/12 16:50	
Tetrachloro-m-xylene [2]	92.5	30-150						4/2/12 16:50	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBB-022

Sampled: 3/29/2012 14:10

Sample ID: 12C0993-18

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1221 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1232 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1242 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1248 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1254 [1]	4.1	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1260 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1262 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Aroclor-1268 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:02	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	95.4	30-150							
Decachlorobiphenyl [2]	99.8	30-150							
Tetrachloro-m-xylene [1]	102	30-150							
Tetrachloro-m-xylene [2]	95.7	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBR-024

Sampled: 3/29/2012 14:30

Sample ID: 12C0993-19

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1221 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1232 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1242 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1248 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1254 [1]	8.2	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1260 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1262 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Aroclor-1268 [1]	ND	0.95	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:41	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	95.7	30-150						4/3/12 7:41	
Decachlorobiphenyl [2]	93.0	30-150						4/3/12 7:41	
Tetrachloro-m-xylene [1]	106	30-150						4/3/12 7:41	
Tetrachloro-m-xylene [2]	95.1	30-150						4/3/12 7:41	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-025

Sampled: 3/29/2012 14:40

Sample ID: 12C0993-20

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1221 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1232 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1242 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1248 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1254 [1]	2300	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1260 [2]	760	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1262 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Aroclor-1268 [1]	ND	170	mg/Kg	1000		SW-846 8082A	4/2/12	4/5/12 0:50	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 0:50	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 0:50	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 0:50	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 0:50	



Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBB-027

Sampled: 3/29/2012 14:55

Sample ID: 12C0993-21

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1221 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1232 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1242 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1248 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1254 [1]	2.9	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1260 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1262 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Aroclor-1268 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:27	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	90.9	30-150							
Decachlorobiphenyl [2]	94.9	30-150							
Tetrachloro-m-xylene [1]	97.4	30-150							
Tetrachloro-m-xylene [2]	90.8	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBR-029

Sampled: 3/29/2012 15:10

Sample ID: 12C0993-22

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1221 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1232 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1242 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1248 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1254 [1]	10	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1260 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1262 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Aroclor-1268 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 7:53	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	93.9	30-150						4/3/12 7:53	
Decachlorobiphenyl [2]	92.1	30-150						4/3/12 7:53	
Tetrachloro-m-xylene [1]	105	30-150						4/3/12 7:53	
Tetrachloro-m-xylene [2]	94.1	30-150						4/3/12 7:53	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBB-030

Sampled: 3/29/2012 15:20

Sample ID: 12C0993-23

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1221 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1232 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1242 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1248 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1254 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1260 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1262 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Aroclor-1268 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 17:52	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	96.5	30-150						4/2/12 17:52	
Decachlorobiphenyl [2]	101	30-150						4/2/12 17:52	
Tetrachloro-m-xylene [1]	101	30-150						4/2/12 17:52	
Tetrachloro-m-xylene [2]	94.4	30-150						4/2/12 17:52	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBB-031

Sampled: 3/29/2012 15:25

Sample ID: 12C0993-24

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1254 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:04	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	94.2	30-150						4/2/12 18:04	
Decachlorobiphenyl [2]	98.5	30-150						4/2/12 18:04	
Tetrachloro-m-xylene [1]	98.7	30-150						4/2/12 18:04	
Tetrachloro-m-xylene [2]	91.7	30-150						4/2/12 18:04	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBK-032

Sampled: 3/29/2012 15:26

Sample ID: 12C0993-25

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1221 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1232 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1242 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1248 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1254 [1]	6500	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1260 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1262 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Aroclor-1268 [1]	ND	440	mg/Kg	2500		SW-846 8082A	4/2/12	4/5/12 1:03	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 1:03	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 1:03	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 1:03	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 1:03	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBR-033

Sampled: 3/29/2012 15:35

Sample ID: 12C0993-26

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1254 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	3/30/12	4/2/12 18:16	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	93.1	30-150						4/2/12 18:16	
Decachlorobiphenyl [2]	97.3	30-150						4/2/12 18:16	
Tetrachloro-m-xylene [1]	97.3	30-150						4/2/12 18:16	
Tetrachloro-m-xylene [2]	90.1	30-150						4/2/12 18:16	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBR-035

Sampled: 3/29/2012 16:05

Sample ID: 12C0993-27

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1221 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1232 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1242 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1248 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1254 [1]	7.9	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1260 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1262 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Aroclor-1268 [1]	ND	1.0	mg/Kg	10		SW-846 8082A	3/30/12	4/3/12 8:06	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	94.7	30-150						4/3/12 8:06	
Decachlorobiphenyl [2]	93.1	30-150						4/3/12 8:06	
Tetrachloro-m-xylene [1]	105	30-150						4/3/12 8:06	
Tetrachloro-m-xylene [2]	93.4	30-150						4/3/12 8:06	

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBKD-040

Sampled: 3/29/2012 09:50

Sample ID: 12C0993-30

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1221 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1232 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1242 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1248 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1254 [1]	440000	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1260 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1262 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Aroclor-1268 [1]	ND	36000	mg/Kg	200000		SW-846 8082A	4/2/12	4/5/12 10:58	PJG
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			4/5/12 10:58	
Decachlorobiphenyl [2]	*	30-150			S-01			4/5/12 10:58	
Tetrachloro-m-xylene [1]	*	30-150			S-01			4/5/12 10:58	
Tetrachloro-m-xylene [2]	*	30-150			S-01			4/5/12 10:58	



Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBBD-041

Sampled: 3/29/2012 14:10

Sample ID: 12C0993-31

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1254 [2]	3.2	0.48	mg/Kg	5	P-04	SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/2/12	4/4/12 2:20	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	104	30-150							
Decachlorobiphenyl [2]	104	30-150							
Tetrachloro-m-xylene [1]	106	30-150							
Tetrachloro-m-xylene [2]	106	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0993

Date Received: 3/30/2012

Field Sample #: KCL-CBBQ-042

Sampled: 3/29/2012 17:10

Sample ID: 12C0993-32

Sample Matrix: Equipment Blank Water

### Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1221 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1232 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1242 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1248 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1254 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1260 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1262 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Aroclor-1268 [1]	ND	0.20	µg/L	1		SW-846 8082A	3/31/12	4/2/12 14:50	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	54.2	30-150						4/2/12 14:50	
Decachlorobiphenyl [2]	53.4	30-150						4/2/12 14:50	
Tetrachloro-m-xylene [1]	90.3	30-150						4/2/12 14:50	
Tetrachloro-m-xylene [2]	91.9	30-150						4/2/12 14:50	

### Sample Extraction Data

Prep Method: SW-846 3546-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12C0993-01 [KCL-CBK-001]	B048989	0.532	10.0	04/02/12
12C0993-02 [KCL-CBK-002]	B048989	0.552	10.0	04/02/12
12C0993-03 [KCL-CBK-003]	B048989	0.560	10.0	04/02/12
12C0993-04 [KCL-CBK-004]	B048989	0.579	10.0	04/02/12
12C0993-05 [KCL-CBK-005]	B048989	0.502	10.0	04/02/12
12C0993-06 [KCL-CBK-006]	B048989	0.558	10.0	04/02/12
12C0993-07 [KCL-CBK-007]	B048989	0.528	10.0	04/02/12
12C0993-08 [KCL-CBK-008]	B048989	0.531	10.0	04/02/12
12C0993-09 [KCL-CBK-012]	B048989	0.512	10.0	04/02/12
12C0993-10 [KCL-CBK-013]	B048989	0.523	10.0	04/02/12
12C0993-11 [KCL-CBK-014]	B048989	0.523	10.0	04/02/12
12C0993-14 [KCL-CBK-017]	B048989	0.578	10.0	04/02/12
12C0993-15 [KCL-CBK-018]	B048989	0.557	10.0	04/02/12
12C0993-20 [KCL-CBK-025]	B048989	0.579	10.0	04/02/12
12C0993-25 [KCL-CBK-032]	B048989	0.562	10.0	04/02/12
12C0993-30 [KCL-CBKD-040]	B048989	0.558	10.0	04/02/12

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12C0993-12 [KCL-CBC-015]	B048908	2.10	10.0	03/30/12
12C0993-13 [KCL-CBC-016]	B048908	2.10	10.0	03/30/12
12C0993-16 [KCL-CBB-019]	B048908	2.10	10.0	03/30/12
12C0993-17 [KCL-CBB-020]	B048908	2.00	10.0	03/30/12
12C0993-18 [KCL-CBB-022]	B048908	2.00	10.0	03/30/12
12C0993-19 [KCL-CBR-024]	B048908	2.10	10.0	03/30/12
12C0993-21 [KCL-CBB-027]	B048908	2.30	10.0	03/30/12
12C0993-22 [KCL-CBR-029]	B048908	2.00	10.0	03/30/12
12C0993-23 [KCL-CBB-030]	B048908	2.30	10.0	03/30/12
12C0993-24 [KCL-CBB-031]	B048908	2.10	10.0	03/30/12
12C0993-26 [KCL-CBR-033]	B048908	2.10	10.0	03/30/12
12C0993-27 [KCL-CBR-035]	B048908	2.00	10.0	03/30/12

Prep Method: SW-846 3546-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12C0993-31 [KCL-CBBD-041]	B048990	2.06	10.0	04/02/12

Prep Method: SW-846 3510C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
12C0993-32 [KCL-CBBQ-042]	B048921	1000	10.0	03/31/12

**QUALITY CONTROL**
**Polychlorinated Biphenyls By GC/ECD - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B048921 - SW-846 3510C**
**Blank (B048921-BLK1)**

Prepared: 03/31/12 Analyzed: 04/02/12

Aroclor-1016	ND	0.20	µg/L							
Aroclor-1016 [2C]	ND	0.20	µg/L							
Aroclor-1221	ND	0.20	µg/L							
Aroclor-1221 [2C]	ND	0.20	µg/L							
Aroclor-1232	ND	0.20	µg/L							
Aroclor-1232 [2C]	ND	0.20	µg/L							
Aroclor-1242	ND	0.20	µg/L							
Aroclor-1242 [2C]	ND	0.20	µg/L							
Aroclor-1248	ND	0.20	µg/L							
Aroclor-1248 [2C]	ND	0.20	µg/L							
Aroclor-1254	ND	0.20	µg/L							
Aroclor-1254 [2C]	ND	0.20	µg/L							
Aroclor-1260	ND	0.20	µg/L							
Aroclor-1260 [2C]	ND	0.20	µg/L							
Aroclor-1262	ND	0.20	µg/L							
Aroclor-1262 [2C]	ND	0.20	µg/L							
Aroclor-1268	ND	0.20	µg/L							
Aroclor-1268 [2C]	ND	0.20	µg/L							
Surrogate: Decachlorobiphenyl	1.24		µg/L	2.00		61.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.21		µg/L	2.00		60.6	30-150			
Surrogate: Tetrachloro-m-xylene	1.41		µg/L	2.00		70.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.43		µg/L	2.00		71.6	30-150			

**LCS (B048921-BS1)**

Prepared: 03/31/12 Analyzed: 04/02/12

Aroclor-1016	0.42	0.20	µg/L	0.500		83.7	40-140			
Aroclor-1016 [2C]	0.42	0.20	µg/L	0.500		83.2	40-140			
Aroclor-1260	0.39	0.20	µg/L	0.500		77.2	40-140			
Aroclor-1260 [2C]	0.38	0.20	µg/L	0.500		75.2	40-140			
Surrogate: Decachlorobiphenyl	1.25		µg/L	2.00		62.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.22		µg/L	2.00		61.2	30-150			
Surrogate: Tetrachloro-m-xylene	1.49		µg/L	2.00		74.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.53		µg/L	2.00		76.6	30-150			

**LCS Dup (B048921-BSD1)**

Prepared: 03/31/12 Analyzed: 04/02/12

Aroclor-1016	0.47	0.20	µg/L	0.500		94.9	40-140	12.6	20	
Aroclor-1016 [2C]	0.47	0.20	µg/L	0.500		94.6	40-140	12.8	20	
Aroclor-1260	0.44	0.20	µg/L	0.500		87.3	40-140	12.4	20	
Aroclor-1260 [2C]	0.43	0.20	µg/L	0.500		85.7	40-140	13.1	20	
Surrogate: Decachlorobiphenyl	1.36		µg/L	2.00		68.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.34		µg/L	2.00		67.2	30-150			
Surrogate: Tetrachloro-m-xylene	1.71		µg/L	2.00		85.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.76		µg/L	2.00		87.9	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B048908 - SW-846 3540C**
**Blank (B048908-BLK1)**

Prepared: 03/30/12 Analyzed: 04/02/12

Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	0.966		mg/Kg	1.00		96.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.01		mg/Kg	1.00		101	30-150			
Surrogate: Tetrachloro-m-xylene	1.03		mg/Kg	1.00		103	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.967		mg/Kg	1.00		96.7	30-150			

**LCS (B048908-BS1)**

Prepared: 03/30/12 Analyzed: 04/02/12

Aroclor-1016	0.28	0.10	mg/Kg	0.250		111	40-140			
Aroclor-1016 [2C]	0.26	0.10	mg/Kg	0.250		105	40-140			
Aroclor-1260	0.26	0.10	mg/Kg	0.250		105	40-140			
Aroclor-1260 [2C]	0.25	0.10	mg/Kg	0.250		99.1	40-140			
Surrogate: Decachlorobiphenyl	0.975		mg/Kg	1.00		97.5	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.02		mg/Kg	1.00		102	30-150			
Surrogate: Tetrachloro-m-xylene	0.987		mg/Kg	1.00		98.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.965		mg/Kg	1.00		96.5	30-150			

**LCS Dup (B048908-BSD1)**

Prepared: 03/30/12 Analyzed: 04/02/12

Aroclor-1016	0.28	0.10	mg/Kg	0.250		113	40-140	1.32	30	
Aroclor-1016 [2C]	0.26	0.10	mg/Kg	0.250		104	40-140	1.12	30	
Aroclor-1260	0.26	0.10	mg/Kg	0.250		104	40-140	1.34	30	
Aroclor-1260 [2C]	0.24	0.10	mg/Kg	0.250		97.8	40-140	1.29	30	
Surrogate: Decachlorobiphenyl	0.947		mg/Kg	1.00		94.7	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.995		mg/Kg	1.00		99.5	30-150			
Surrogate: Tetrachloro-m-xylene	0.972		mg/Kg	1.00		97.2	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.947		mg/Kg	1.00		94.7	30-150			

## QUALITY CONTROL

## Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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## Batch B048908 - SW-846 3540C

Matrix Spike (B048908-MS1)		Source: 12C0993-12		Prepared: 03/30/12 Analyzed: 04/03/12						
Aroclor-1016	0.65	0.10	mg/Kg	0.250	0.0	260	*	40-140		MS-21
Aroclor-1016 [2C]	1.5	0.10	mg/Kg	0.250	0.0	602	*	40-140		MS-21
Aroclor-1260	1.6	0.10	mg/Kg	0.250	0.0	620	*	40-140		MS-21
Aroclor-1260 [2C]	1.5	0.10	mg/Kg	0.250	0.0	611	*	40-140		MS-21
Surrogate: Decachlorobiphenyl	0.877		mg/Kg	1.00		87.7		30-150		
Surrogate: Decachlorobiphenyl [2C]	0.881		mg/Kg	1.00		88.1		30-150		
Surrogate: Tetrachloro-m-xylene	0.933		mg/Kg	1.00		93.3		30-150		
Surrogate: Tetrachloro-m-xylene [2C]	0.899		mg/Kg	1.00		89.9		30-150		

Matrix Spike Dup (B048908-MSD1)	Source: 12C0993-12			Prepared: 03/30/12 Analyzed: 04/03/12							
Aroclor-1016	0.81	0.10	mg/Kg	0.250	0.0	324	*	40-140	21.8	50	MS-21
Aroclor-1016 [2C]	1.4	0.10	mg/Kg	0.250	0.0	569	*	40-140	5.63	50	MS-21
Aroclor-1260	1.4	0.10	mg/Kg	0.250	0.0	577	*	40-140	7.20	50	MS-21
Aroclor-1260 [2C]	1.4	0.10	mg/Kg	0.250	0.0	567	*	40-140	7.42	50	MS-21
Surrogate: Decachlorobiphenyl	0.928		mg/Kg	1.00		92.8		30-150			
Surrogate: Decachlorobiphenyl [2C]	0.937		mg/Kg	1.00		93.7		30-150			
Surrogate: Tetrachloro-m-xylene	0.963		mg/Kg	1.00		96.3		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.926		mg/Kg	1.00		92.6		30-150			

## Batch B048989 - SW-846 3546

Blank (B048989-BLK1)		Prepared: 04/02/12 Analyzed: 04/04/12								
Aroclor-1016	ND	0.20	mg/Kg							
Aroclor-1016 [2C]	ND	0.20	mg/Kg							
Aroclor-1221	ND	0.20	mg/Kg							
Aroclor-1221 [2C]	ND	0.20	mg/Kg							
Aroclor-1232	ND	0.20	mg/Kg							
Aroclor-1232 [2C]	ND	0.20	mg/Kg							
Aroclor-1242	ND	0.20	mg/Kg							
Aroclor-1242 [2C]	ND	0.20	mg/Kg							
Aroclor-1248	ND	0.20	mg/Kg							
Aroclor-1248 [2C]	ND	0.20	mg/Kg							
Aroclor-1254	ND	0.20	mg/Kg							
Aroclor-1254 [2C]	ND	0.20	mg/Kg							
Aroclor-1260	ND	0.20	mg/Kg							
Aroclor-1260 [2C]	ND	0.20	mg/Kg							
Aroclor-1262	ND	0.20	mg/Kg							
Aroclor-1262 [2C]	ND	0.20	mg/Kg							
Aroclor-1268	ND	0.20	mg/Kg							
Aroclor-1268 [2C]	ND	0.20	mg/Kg							
Surrogate: Decachlorobiphenyl	3.56		mg/Kg	4.00		89.0		30-150		
Surrogate: Decachlorobiphenyl [2C]	3.64		mg/Kg	4.00		91.0		30-150		
Surrogate: Tetrachloro-m-xylene	4.57		mg/Kg	4.00		114		30-150		
Surrogate: Tetrachloro-m-xylene [2C]	4.52		mg/Kg	4.00		113		30-150		

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B048989 - SW-846 3546**
**LCS (B048989-BS1)**

Prepared: 04/02/12 Analyzed: 04/04/12

Aroclor-1016	4.2	0.20	mg/Kg	4.00		106	40-140			
Aroclor-1016 [2C]	4.3	0.20	mg/Kg	4.00		108	40-140			
Aroclor-1260	3.6	0.20	mg/Kg	4.00		91.1	40-140			
Aroclor-1260 [2C]	3.7	0.20	mg/Kg	4.00		93.2	40-140			
Surrogate: Decachlorobiphenyl	3.28		mg/Kg	4.00		82.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.32		mg/Kg	4.00		83.0	30-150			
Surrogate: Tetrachloro-m-xylene	4.73		mg/Kg	4.00		118	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	4.69		mg/Kg	4.00		117	30-150			

**LCS Dup (B048989-BSD1)**

Prepared: 04/02/12 Analyzed: 04/04/12

Aroclor-1016	4.0	0.20	mg/Kg	4.00		98.9	40-140	7.14	30	
Aroclor-1016 [2C]	4.1	0.20	mg/Kg	4.00		104	40-140	4.43	30	
Aroclor-1260	3.4	0.20	mg/Kg	4.00		84.5	40-140	7.45	30	
Aroclor-1260 [2C]	3.4	0.20	mg/Kg	4.00		86.2	40-140	7.79	30	
Surrogate: Decachlorobiphenyl	2.97		mg/Kg	4.00		74.2	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.02		mg/Kg	4.00		75.6	30-150			
Surrogate: Tetrachloro-m-xylene	4.51		mg/Kg	4.00		113	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	4.48		mg/Kg	4.00		112	30-150			

**Batch B048990 - SW-846 3546**
**Blank (B048990-BLK1)**

Prepared: 04/02/12 Analyzed: 04/04/12

Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	0.961		mg/Kg	1.00		96.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.972		mg/Kg	1.00		97.2	30-150			
Surrogate: Tetrachloro-m-xylene	0.938		mg/Kg	1.00		93.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.932		mg/Kg	1.00		93.2	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

**Batch B048990 - SW-846 3546**
**LCS (B048990-BS1)**

Prepared: 04/02/12 Analyzed: 04/04/12

Aroclor-1016	0.25	0.10	mg/Kg	0.250		101	40-140			V-06, V-20
Aroclor-1016 [2C]	0.26	0.10	mg/Kg	0.250		102	40-140			
Aroclor-1260	0.25	0.10	mg/Kg	0.250		100	40-140			
Aroclor-1260 [2C]	0.27	0.10	mg/Kg	0.250		106	40-140			
Surrogate: Decachlorobiphenyl	0.951		mg/Kg	1.00		95.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.962		mg/Kg	1.00		96.2	30-150			
Surrogate: Tetrachloro-m-xylene	0.938		mg/Kg	1.00		93.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.924		mg/Kg	1.00		92.4	30-150			

**LCS Dup (B048990-BSD1)**

Prepared: 04/02/12 Analyzed: 04/04/12

Aroclor-1016	0.27	0.10	mg/Kg	0.250		109	40-140	7.82	30	V-06, V-20
Aroclor-1016 [2C]	0.28	0.10	mg/Kg	0.250		111	40-140	8.23	30	
Aroclor-1260	0.27	0.10	mg/Kg	0.250		108	40-140	7.18	30	
Aroclor-1260 [2C]	0.28	0.10	mg/Kg	0.250		113	40-140	5.94	30	
Surrogate: Decachlorobiphenyl	1.02		mg/Kg	1.00		102	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.04		mg/Kg	1.00		104	30-150			
Surrogate: Tetrachloro-m-xylene	0.998		mg/Kg	1.00		99.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.990		mg/Kg	1.00		99.0	30-150			



**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
MS-21	Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.
P-04	Due to continuing calibration non-conformance on the confirmatory detector, the lower of two results was reported.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
V-06	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

# CERTIFICATIONS

## Certified Analyses included in this Report

Analyte	Certifications
<b><i>SW-846 8082A in Product/Solid</i></b>	
Aroclor-1016	CT,NH,NY,ME,NC
Aroclor-1016 [2C]	CT,NH,NY,ME,NC
Aroclor-1221	CT,NH,NY,ME,NC
Aroclor-1221 [2C]	CT,NH,NY,ME,NC
Aroclor-1232	CT,NH,NY,ME,NC
Aroclor-1232 [2C]	CT,NH,NY,ME,NC
Aroclor-1242	CT,NH,NY,ME,NC
Aroclor-1242 [2C]	CT,NH,NY,ME,NC
Aroclor-1248	CT,NH,NY,ME,NC
Aroclor-1248 [2C]	CT,NH,NY,ME,NC
Aroclor-1254	CT,NH,NY,ME,NC
Aroclor-1254 [2C]	CT,NH,NY,ME,NC
Aroclor-1260	CT,NH,NY,ME,NC
Aroclor-1260 [2C]	CT,NH,NY,ME,NC
<b><i>SW-846 8082A in Water</i></b>	
Aroclor-1016	CT,NH,NY,RI,NC,ME
Aroclor-1016 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1221	CT,NH,NY,RI,NC,ME
Aroclor-1221 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1232	CT,NH,NY,RI,NC,ME
Aroclor-1232 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1242	CT,NH,NY,RI,NC,ME
Aroclor-1242 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1248	CT,NH,NY,RI,NC,ME
Aroclor-1248 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1254	CT,NH,NY,RI,NC,ME
Aroclor-1254 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1260	CT,NH,NY,RI,NC,ME
Aroclor-1260 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1262	NC
Aroclor-1262 [2C]	NC
Aroclor-1268	NC
Aroclor-1268 [2C]	NC

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2012
CT	Connecticut Department of Public Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2013
RI	Rhode Island Department of Health	LAO00112	12/30/2012
NC	North Carolina Div. of Water Quality	652	12/31/2012
NJ	New Jersey DEP	MA007 NELAP	06/30/2012
FL	Florida Department of Health	E871027 NELAP	06/30/2012
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2012
WA	State of Washington Department of Ecology	C2065	02/23/2013
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	1381	12/14/2012

**CHAIN OF CUSTODY RECORD**

39 Spruce Street  
East Longmeadow, MA 01028

Page 1 of 4

Company Name: **Woodsboro & Curran**

Telephone: **978 551 8150**

Address: **35 NE Bus. Ctr. Suite 180**

Project # **225540**

**Andrew Ma OBIO**

Client PO#

Attention: **George Farnum**

DATA DELIVERY (check all that apply)  
☐ FAX ☐ EMAIL ☐ WEBSITE

Project Location: **MAE KCL**

Fax #

Sampled By: **George Farnum**

Email: **g.farnum@mae.com**

Project Proposal Provided? (for billing purposes)

☐ Yes ☐ No

Collection

☐ "Enhanced Data Package"

Con-Test Lab ID

(laboratory use only)

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Composite

Grab

\*Matrix

Unit

Code

Notes

Analysis Requested

Preservation

Container Code

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Cont. Code:

A=amber glass

G=glass

P=plastic

ST=sterile

V=vial

S=Summa can

T=tedlar bag

O=Other

\*\*Preservation

I=iced

H=HCL

M=Methanol

N=Nitric Acid

S=Sulfuric Acid

B=Sodium bisulfate

X=Na hydroxide

T=Na thiosulfate

O=Other

\*Matrix Code:

GW=groundwater

WW=wastewater

DW=drinking water

A=air

S=soil/solid

SL=sludge

O=other

CAULK

Comments: **PCBs via USEPA 8082 w/ Soxhlet Extraction (3500C)**

**Customer unknown but may be High. This is**

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Is your project MCP or RCP?

☐ MCP Analytical Certification Form Required

☐ RCP Analysis Certification Form Required

☐ MA State DW Form Required PW/SID #



NELAC & AIHA Certified  
WBE/DBE Certified

TURNAROUND TIME (business days) STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED.

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**CHAIN OF CUSTODY RECORD**

39 Spruce Street  
East Longmeadow, MA 01028

Page 2 of 4

Company Name: Woodard & Curran

Telephone: 978 557 8150

Address: 35 NE BUS CTR Sute 180

Project # 225540

Andover, MA 01810

Client PO#

Attention: George Franklin

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Project Location: Yale KCL

Fax #

Sampled By: George Franklin

Email:

Project Proposal Provided? (for billing purposes)  
☐ yes ☐ proposal date

Format:

☒ PDF ☐ EXCEL ☐ GIS  
☐ OTHER

**Collection**

☐ "Enhanced Data Package"

Con-Test Lab ID  
(laboratory use only)

Beginning Date/Time

Ending Date/Time

Composite

Grab

\*Matrix Date

Long Date

PCBs (8082/3540C)

ANALYSIS REQUESTED

# of Containers  
\*\* Preservation  
\*\*\* Container Code  
Dissolved Metals  
☐ Field Filtered  
☐ Lab to Filter

\*\*\*Cont. Code:  
A=amber glass  
G=glass  
P=plastic  
ST=sterile  
V=vial  
S=summary can  
T=tedlar bag  
O=Other

\*\*Preservation  
I = Iced  
H = HCl  
M = Methanol  
N = Nitric Acid  
S = Sulfuric Acid  
B = Sodium bisulfate  
X = Na hydroxide  
T = Na thiosulfate  
O = Other

\*Matrix Code:  
GW= groundwater  
WW= wastewater  
DW= drinking water  
A = air  
S = soil/solid  
SL = sludge  
O = other Caik

09	KCL-CBK-012	3/29/12	1135	X	O	U*	X
10	KCL-CBK-013	3/29/12	1138	X	O	U*	X
11	KCL-CBK-014	3/29/12	1158	X	O	U*	X
12	KCL-CBC-015	3/29/12	1210	X	58	80	X
13	KCL-CBC-016	3/29/12	1220	X	58	80	X
14	KCL-CBK-017	3/29/12	1250	X	O	U*	X
15	KCL-CBK-018	3/29/12	1305	X	O	U*	X
16	KCL-CBK-019	3/29/12	1315	X	S	U	X
17	KCL-CBK-020	3/29/12	1325	X	S	U	X

Comments: PCBs via USEPA 8082 w/ Soxhlet Extraction (3540C)  
\* Concentration unknown but may be high. This is potential source material

Relinquished by (signature)

Date/Time: 3/30/12 10:55

Turnaround <sup>††</sup>  
☐ 7-Day  
☐ 10-Day  
☒ Other 5 days  
☐ 124-Hr ☐ 148-Hr  
☐ 172-Hr ☐ 14-Day  
☐ Require lab approval

Detection Limit Requirements  
Massachusetts:

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PWSID #

NEIAC & AIHA Certified  
WBE/DBE Certified

Received by (signature)

Date/Time: 3/30/12 10:25

Connecticut:

Other:

Relinquished by (signature)

Date/Time: 3/30/12 17:45

Received by (signature)

Date/Time: 3/30/12 17:45

Other:

Relinquished by (signature)

TURNAROUND TIME (business days) STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED.



ANALYTICAL LABORATORY

Phone: 413-525-2332  
Fax: 413-525-6405  
Email: info@contestlabs.com  
www.contestlabs.com

# CHAIN OF CUSTODY RECORD

39 Spruce Street  
East Longmeadow, MA 01028

Page 3 of 51

Company Name: Woburns ? Curran

Telephone: 978 557 8150

Address: 35 NE Bus Ctr S. 1st 150

Project # 225540

Attention: George Farnum

Client PO# 225540

Project Location: Yale KCL

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Sampled By: George Farnum

Fax #  
Email: g.farnum@yale.edu

Project Proposal Provided? (for billing purposes)  
☐ Yes ☐ No

Format: ☒ PDF ☐ EXCEL ☐ GIS  
☐ OTHER

Con-Test Lab ID (laboratory use only)

Collection ☐ "Enhanced Data Package"

Client Sample ID / Description

Beginning Date/Time Ending Date/Time Composite Grab \*Matrix Date Date

PCB

ANALYSIS REQUESTED

# of Containers  
\*\* Preservation  
\*\*\* Container Cod

18 KCL-CBB-022

3/29/12 1410 X S U X

1

Dissolved Metals  
☐ Field Filtered  
☐ Lab to Filter

19 KCL-CBB-024

3/29/12 1430 X S U X

2

\*\*Cont. Code:  
A=amber glass  
G=glass  
P=plastic  
ST=sterile  
V=vial  
S=summary can  
T=tetrad bag  
O=Other

20 KCL-CBK-025

3/29/12 1450 X S U X

3

\*\*Preservation  
1 = Iced  
H = HCL  
M = Methanol  
N = Nitric Acid  
S = Sulfuric Acid  
B = Sodium bisulfate  
X = Na hydroxide  
T = Na thiosulfate  
O = Other

21 KCL-CBB-027

3/29/12 1455 X S U X

4

\*Matrix Code:  
GW= groundwater  
WW= wastewater  
DW= drinking water  
A= air  
S= soil/solid  
SL= sludge  
O= other

22 KCL-CBB-029

3/29/12 1510 X S U X

5

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

23 KCL-CBB-030

3/29/12 1520 X S U X

6

NEIAC & AIHA Certified  
WBE/DBE Certified

Comments: REGs via USEPA 8082-11 SOUTHERN EXTRACTION (35000)  
High Concentration MAT BE SURE MAXIMUM

Relinquished by (signature) [Signature] Date/Time: 7/30/12 10:25

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Received by (signature) [Signature] Date/Time: 3/29/12

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Relinquished by (signature) [Signature] Date/Time: 3/30/12 17:45

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Received by (signature) [Signature] Date/Time: 3/30/12 17:45

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Received by (signature) [Signature] Date/Time: 3/30/12 17:45

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Received by (signature) [Signature] Date/Time: 3/30/12 17:45

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Received by (signature) [Signature] Date/Time: 3/30/12 17:45

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

Received by (signature) [Signature] Date/Time: 3/30/12 17:45

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other 5 DAY

Detection Limit Requirements  
Massachusetts:                     

Is your project MCP or RCP?  
☐ MCP Analytical Certification Form Required  
☐ RCP Analysis Certification Form Required  
☐ MA State DW Form Required PW/SID #

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PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT



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WBE/DBE Certified



**con-test**  
ANALYTICAL LABORATORY

Phone: 413-525-2332  
Fax: 413-525-6405  
Email: info@contestlabs.com  
www.contestlabs.com

# CHAIN OF CUSTODY RECORD

39 Spruce Street  
East Longmeadow, MA 01028

Page 1 of 1

Company Name: 13000 Airo i. Curran

Telephone: 978 557 8150

Address: 35 NE B. Co. Suite 180

Project # 225540

Attention: George F. Curran

Client PO#

Project Location: Yale KCL

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Sampled By: George F. Curran

Fax #

Project Proposal Provided? (for billing purposes)  
☐ yes ☐ no

Email: George F. Curran

Format: ☒ PDF ☐ EXCEL ☐ GIS

Collection ☐ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Composite

Grab

\*Matrix

Lot/Lab

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

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Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

Conc. Code

## ANALYSIS REQUESTED

Field Filtered  
Lab to Filter

\*\*\*Cont. Code:

A=amber glass  
G=glass  
P=plastic  
ST=sterile  
V=vial

S=summary can  
T=tedlar bag  
O=Other

\*\*\*Preservation

I = Iced  
H = HCL  
M = Methanol  
N = Nitric Acid  
S = Sulfuric Acid  
B = Sodium bisulfate  
X = Na hydroxide  
T = Na thiosulfate  
O = Other

\*\*\*Matrix Code:

GW = groundwater  
WW = wastewater  
DW = drinking water  
A = air  
S = soil/solid  
Sl = sludge  
O = other

Comments: PCS via USEPA 8091 V Seawater Extraction (3544)

MAN BE HUNTER IMPROVED PORTION SEWAGE MATRICE

Relinquished by (signature)

Date/Time: 3/24/12 10:25

Relinquished by (signature)

Date/Time: 3/24/12 10:25

Relinquished by (signature)

Date/Time: 3/24/12 10:25

Relinquished by (signature)

Date/Time: 3/24/12 10:25

Relinquished by (signature)

Date/Time: 3/24/12 10:25



**con-test**  
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**CHAIN OF CUSTODY RECORD**

39 Spruce Street  
East Longmeadow, MA 01028

Page 5 of 5

Company Name: Woodard & Loeb

Telephone: 978 557 8150

Address: 35 NE Bus Cir Suite 100

Project # 225540

Attention: Denise Franck

Client PO#

Project Location: Yau KCL

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Sampled By: Denise Franck

Fax #

Project Proposal Provided? (for billing purposes)

Email: 39 Spruce Street

☐ Yes ☐ No  
Proposal date

Format: GDF CEXCEL OGIS  
☐ OTHER

**Collection**

☐ "Enhanced Data Package"

Con-Test Lab ID

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Composite

Grab

Matrix Code

Cont. Code

Analysis Requested

Preservation

Matrix Code

GW = groundwater

WW = wastewater

DW = drinking water

A = air

S = soil/solid

SL = sludge

Received by: (signature)

Date/Time: 1/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

Received by: (signature)

Date/Time: 3/20/12 10:15

Turnaround <sup>TT</sup>

7-Day

10-Day

Other

RUSH <sup>†</sup>

Connecticut

Massachusetts

Other

Dissolved Metals

Field Filtered

Lab to Filter

\*\*Container Code

# of Containers

\*\* Preservation

\*\*\*Cont. Code:

IF TURNAROUND TIME (business days) STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED.

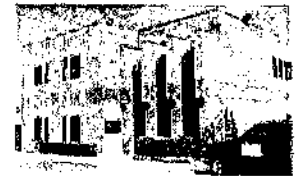
PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT



NELAC & AIHA Certified  
WB/DBE Certified



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## Sample Receipt Checklist

CLIENT NAME: Woodward + Curran RECEIVED BY: C.C.S. DATE: 3/30/12

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples? Yes No

If not, explain:

3) Are all the samples in good condition? Yes No

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 4.2°C

5) Are there Dissolved samples for the lab to filter? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No  
(Walk-in clients only) If not already approved  
Client Signature: \_\_\_\_\_

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

## Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber	<u>2</u>	8 oz <u>amber</u> clear jar	<u>31</u>
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____	Time and Date Frozen:
Doc# 277 # Bisulfate _____ # DI Water _____	
Rev. 2 Sept 2011 # Thiosulfate _____ Unpreserved _____	

April 16, 2012

George Franklin  
Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810

Project Location: Yale KCL  
Client Job Number:  
Project Number: 225540  
Laboratory Work Order Number: 12C0994

Enclosed are results of analyses for samples received by the laboratory on March 30, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley  
Project Manager

Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810  
ATTN: George Franklin

REPORT DATE: 4/16/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 225540

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 12C0994

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Yale KCL

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
----------------	---------	--------	--------------------	------	---------

KCL-CBB-021	12C0994-03	Product/Solid		SW-846 8082A	
KCL-CBB-026	12C0994-04	Product/Solid		SW-846 8082A	
KCL-CBR-023	12C0994-05	Product/Solid		SW-846 8082A	
KCL-CBR-028	12C0994-06	Product/Solid		SW-846 8082A	
KCL-CBR-034	12C0994-07	Product/Solid		SW-846 8082A	
KCL-CBB-011	12C0994-10	Product/Solid		SW-846 8082A	

**CASE NARRATIVE SUMMARY**

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

**SW-846 8082A**

**Qualifications:**

---

Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.

**Analyte & Samples(s) Qualified:**

**Aroclor-1260, Aroclor-1260 [2C]**

B049481-MS1

---

Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.

**Analyte & Samples(s) Qualified:**

**Aroclor-1260**

 B049481-MS1, B049481-MSD1

---

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian  
Laboratory Manager

Project Location: Yale KCL

Sample Description:

Work Order: 12C0994

Date Received: 3/30/2012

Field Sample #: KCL-CBB-021

Sampled: 3/29/2012 14:05

Sample ID: 12C0994-03

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1221 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1232 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1242 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1248 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1254 [2]	0.11	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1260 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1262 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Aroclor-1268 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:10	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	121	30-150							
Decachlorobiphenyl [2]	110	30-150							
Tetrachloro-m-xylene [1]	114	30-150							
Tetrachloro-m-xylene [2]	126	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0994

Date Received: 3/30/2012

Field Sample #: KCL-CBB-026

Sampled: 3/29/2012 14:50

Sample ID: 12C0994-04

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1248 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1254 [2]	0.22	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:23	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	119	30-150							
Decachlorobiphenyl [2]	108	30-150							
Tetrachloro-m-xylene [1]	104	30-150							
Tetrachloro-m-xylene [2]	114	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0994

Date Received: 3/30/2012

Field Sample #: KCL-CBR-023

Sampled: 3/29/2012 15:05

Sample ID: 12C0994-05

Sample Matrix: Product/Solid

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1221 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1232 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1242 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1248 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1254 [1]	0.63	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1260 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1262 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Aroclor-1268 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:38	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	119	30-150							
Decachlorobiphenyl [2]	108	30-150							
Tetrachloro-m-xylene [1]	97.7	30-150							
Tetrachloro-m-xylene [2]	105	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0994

Date Received: 3/30/2012

Field Sample #: KCL-CBR-028

Sampled: 3/29/2012 15:05

Sample ID: 12C0994-06

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1248 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1254 [2]	0.23	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:36	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	117	30-150							
Decachlorobiphenyl [2]	106	30-150							
Tetrachloro-m-xylene [1]	97.9	30-150							
Tetrachloro-m-xylene [2]	107	30-150							



Project Location: Yale KCL

Sample Description:

Work Order: 12C0994

Date Received: 3/30/2012

Field Sample #: KCL-CBR-034

Sampled: 3/29/2012 15:55

Sample ID: 12C0994-07

Sample Matrix: Product/Solid

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1221 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1232 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1242 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1248 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1254 [2]	0.29	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1260 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1262 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Aroclor-1268 [1]	ND	0.10	mg/Kg	5		SW-846 8082A	4/10/12	4/12/12 9:51	PJG
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	130	30-150							
Decachlorobiphenyl [2]	118	30-150							
Tetrachloro-m-xylene [1]	107	30-150							
Tetrachloro-m-xylene [2]	114	30-150							

Project Location: Yale KCL

Sample Description:

Work Order: 12C0994

Date Received: 3/30/2012

Field Sample #: KCL-CBB-011

Sampled: 3/29/2012 11:15

Sample ID: 12C0994-10

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1221 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1232 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1242 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1248 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1254 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1260 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1262 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Aroclor-1268 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	4/10/12	4/11/12 23:49	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	113	30-150							
Decachlorobiphenyl [2]	103	30-150							
Tetrachloro-m-xylene [1]	97.3	30-150							
Tetrachloro-m-xylene [2]	107	30-150							

### Sample Extraction Data

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12C0994-03 [KCL-CBB-021]	B049481	2.10	10.0	04/10/12
12C0994-04 [KCL-CBB-026]	B049481	2.00	10.0	04/10/12
12C0994-05 [KCL-CBR-023]	B049481	10.0	10.0	04/10/12
12C0994-06 [KCL-CBR-028]	B049481	2.00	10.0	04/10/12
12C0994-07 [KCL-CBR-034]	B049481	10.0	10.0	04/10/12
12C0994-10 [KCL-CBB-011]	B049481	2.20	10.0	04/10/12

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B049481 - SW-846 3540C**
**Blank (B049481-BLK1)**

Prepared: 04/10/12 Analyzed: 04/11/12

Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	1.07		mg/Kg	1.00		107	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.970		mg/Kg	1.00		97.0	30-150			
Surrogate: Tetrachloro-m-xylene	0.936		mg/Kg	1.00		93.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.03		mg/Kg	1.00		103	30-150			

**LCS (B049481-BS1)**

Prepared: 04/10/12 Analyzed: 04/11/12

Aroclor-1016	0.29	0.10	mg/Kg	0.250		117	40-140			
Aroclor-1016 [2C]	0.30	0.10	mg/Kg	0.250		120	40-140			
Aroclor-1260	0.27	0.10	mg/Kg	0.250		110	40-140			
Aroclor-1260 [2C]	0.30	0.10	mg/Kg	0.250		120	40-140			
Surrogate: Decachlorobiphenyl	1.31		mg/Kg	1.00		131	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.17		mg/Kg	1.00		117	30-150			
Surrogate: Tetrachloro-m-xylene	1.10		mg/Kg	1.00		110	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.20		mg/Kg	1.00		120	30-150			

**LCS Dup (B049481-BSD1)**

Prepared: 04/10/12 Analyzed: 04/11/12

Aroclor-1016	0.27	0.10	mg/Kg	0.250		106	40-140	9.91	30	
Aroclor-1016 [2C]	0.27	0.10	mg/Kg	0.250		110	40-140	8.94	30	
Aroclor-1260	0.24	0.10	mg/Kg	0.250		96.8	40-140	12.3	30	
Aroclor-1260 [2C]	0.27	0.10	mg/Kg	0.250		107	40-140	11.2	30	
Surrogate: Decachlorobiphenyl	1.11		mg/Kg	1.00		111	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.01		mg/Kg	1.00		101	30-150			
Surrogate: Tetrachloro-m-xylene	0.974		mg/Kg	1.00		97.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.07		mg/Kg	1.00		107	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B049481 - SW-846 3540C**

<b>Matrix Spike (B049481-MS1)</b>		<b>Source: 12C0994-01</b>		Prepared: 04/10/12 Analyzed: 04/12/12						
Aroclor-1016	0.28	0.10	mg/Kg	0.250	0.0	110	40-140			
Aroclor-1016 [2C]	0.32	0.10	mg/Kg	0.250	0.0	127	40-140			
<b>Aroclor-1260</b>	0.59	0.10	mg/Kg	0.250	0.0	<b>237</b>	* 40-140			MS-21, R-06
<b>Aroclor-1260 [2C]</b>	0.47	0.10	mg/Kg	0.250	0.0	<b>187</b>	* 40-140			MS-21
Surrogate: Decachlorobiphenyl	1.13		mg/Kg	1.00		113	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.07		mg/Kg	1.00		107	30-150			
Surrogate: Tetrachloro-m-xylene	1.02		mg/Kg	1.00		102	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.12		mg/Kg	1.00		112	30-150			

<b>Matrix Spike Dup (B049481-MSD1)</b>		<b>Source: 12C0994-01</b>		Prepared: 04/10/12 Analyzed: 04/12/12						
Aroclor-1016	0.27	0.10	mg/Kg	0.250	0.0	107	40-140	2.65	50	
Aroclor-1016 [2C]	0.29	0.10	mg/Kg	0.250	0.0	118	40-140	7.53	50	
Aroclor-1260	0.33	0.10	mg/Kg	0.250	0.0	134	40-140	<b>55.6</b>	* 50	R-06
Aroclor-1260 [2C]	0.34	0.10	mg/Kg	0.250	0.0	137	40-140	30.7	50	
Surrogate: Decachlorobiphenyl	1.09		mg/Kg	1.00		109	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.02		mg/Kg	1.00		102	30-150			
Surrogate: Tetrachloro-m-xylene	0.981		mg/Kg	1.00		98.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.07		mg/Kg	1.00		107	30-150			

**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
MS-21	Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.
R-06	Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.

# CERTIFICATIONS

## Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8082A in Product/Solid</i>	
Aroclor-1016	CT,NH,NY,ME,NC
Aroclor-1016 [2C]	CT,NH,NY,ME,NC
Aroclor-1221	CT,NH,NY,ME,NC
Aroclor-1221 [2C]	CT,NH,NY,ME,NC
Aroclor-1232	CT,NH,NY,ME,NC
Aroclor-1232 [2C]	CT,NH,NY,ME,NC
Aroclor-1242	CT,NH,NY,ME,NC
Aroclor-1242 [2C]	CT,NH,NY,ME,NC
Aroclor-1248	CT,NH,NY,ME,NC
Aroclor-1248 [2C]	CT,NH,NY,ME,NC
Aroclor-1254	CT,NH,NY,ME,NC
Aroclor-1254 [2C]	CT,NH,NY,ME,NC
Aroclor-1260	CT,NH,NY,ME,NC
Aroclor-1260 [2C]	CT,NH,NY,ME,NC

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2012
CT	Connecticut Department of Public Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2013
RI	Rhode Island Department of Health	LAO00112	12/30/2012
NC	North Carolina Div. of Water Quality	652	12/31/2012
NJ	New Jersey DEP	MA007 NELAP	06/30/2012
FL	Florida Department of Health	E871027 NELAP	06/30/2012
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2012
WA	State of Washington Department of Ecology	C2065	02/23/2013
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	1381	12/14/2012

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39 Spruce St.  
East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
www.contestlabs.com



## Sample Receipt Checklist

CLIENT NAME: Woodward + Curran RECEIVED BY: C.C.S. DATE: 3/30/12

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples? Yes No

If not, explain:

3) Are all the samples in good condition? Yes No

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 4.2°C

5) Are there Dissolved samples for the lab to filter? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No  
(Walk-in clients only) If not already approved  
Client Signature: \_\_\_\_\_

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

## Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz <del>amber</del> /clear jar	<u>10</u>
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_

Time and Date Frozen:

Doc# 247 # Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_

Rev. 2 Sept 2011 # Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

## Meghan Kelley

---

**From:** George Franklin [GFranklin@woodardcurran.com]  
**Sent:** Monday, April 09, 2012 6:47 AM  
**To:** mkelley@contestlabs.com  
**Subject:** Yale KCL Samples

Meghan,

Please have the following samples removed from HOLD and analyzed for the Yale KCL project:



KCL-CBB-021 ✓  
KCL-CBB-026 ✓  
KCL-CBR-023 ✓  
KCL-CBR-028 ✓  
KCL-CBR-034 ✓  
KCL-CBB-011 ✓

I am in the field all day today so call my cell if there are any questions. Standard 5 day turn around on these.

Thank you,

George

George Franklin, CHMM  
Project Scientist  
Woodard and Curran  
Office: (978) 557-8150  
Cell: (978) 317-8200  
[gfranklin@woodardcurran.com](mailto:gfranklin@woodardcurran.com)

**12C0994-03****KCL-CBB-021**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.11	8.332858E-02	27.6
<b>Surrogates</b>			
Decachlorobiphenyl	1.15	1.044924	9.57
Tetrachloro-m-xylene	1.09	1.196143	9.29

**12C0994-04****KCL-CBB-026**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.22	0.17945	20.3
<b>Surrogates</b>			
Decachlorobiphenyl	1.19	1.08463	9.26
Tetrachloro-m-xylene	1.04	1.141035	9.26

**12C0994-05****KCL-CBR-023**

Analyte	Results		%RPD
Aroclor-1254	0.63	0.48567	25.9
<b>Surrogates</b>			
Decachlorobiphenyl	0.239	0.21634	9.95
Tetrachloro-m-xylene	0.195	0.209455	7.15

**12C0994-06****KCL-CBR-028**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.23	0.18179	23.4
<b>Surrogates</b>			
Decachlorobiphenyl	1.17	1.06318	9.57
Tetrachloro-m-xylene	0.979	1.07272	9.14

**12C0994-07****KCL-CBR-034**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.29	0.24939	15.1
<b>Surrogates</b>			
Tetrachloro-m-xylene	0.214	0.228965	6.76
Decachlorobiphenyl	0.260	0.235215	10

**12C0994-10****KCL-CBB-011**

Analyte	Results		%RPD
Surrogates			
Tetrachloro-m-xylene	0.884	0.9707727	9.36
Decachlorobiphenyl	1.03	0.9353091	9.64

**B049481-BLK1****Blank**

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.07	0.969545	9.85
Tetrachloro-m-xylene	0.936	1.02624	9.2

**B049481-BS1** LCS

Analyte	Results		%RPD
Aroclor-1016	0.29	0.300265	3.48
Aroclor-1260	0.27	0.299345	10.3
Surrogates			
Decachlorobiphenyl	1.31	1.168935	11.4
Tetrachloro-m-xylene	1.10	1.203475	8.98

**B049481-BSD1** LCS Dup

Analyte	Results		%RPD
Aroclor-1016	0.27	0.27458	1.68
Aroclor-1260	0.24	0.26771	10.9
Surrogates			
Tetrachloro-m-xylene	0.974	1.06851	9.25
Decachlorobiphenyl	1.11	1.013925	9.05

**B049481-MS1** Matrix Spike

Analyte	Results		%RPD
Aroclor-1016	0.28	0.31801	12.7
Aroclor-1260	0.59	0.468235	23
Surrogates			
Decachlorobiphenyl	1.13	1.066795	5.75
Tetrachloro-m-xylene	1.02	1.11854	9.22

**B049481-MSD1** Matrix Spike Dup

Analyte	Results		%RPD
Aroclor-1016	0.27	0.294935	8.83
Aroclor-1260	0.33	0.34346	4
Surrogates			
Tetrachloro-m-xylene	0.981	1.073935	9.05
Decachlorobiphenyl	1.09	1.023285	6.31

June 15, 2012

Steven Murdzia  
Yale University  
135 College Street, Suite 100  
New Haven, CT 06510

Project Location: KCL  
Client Job Number:  
Project Number: [none]  
Laboratory Work Order Number: 12F0342

Enclosed are results of analyses for samples received by the laboratory on June 11, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light gray rectangular background.

Lisa A. Worthington  
Project Manager

Yale University  
135 College Street, Suite 100  
New Haven, CT 06510  
ATTN: Steven Murdzia

REPORT DATE: 6/15/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

#### ANALYTICAL SUMMARY

WORK ORDER NUMBER: 12F0342

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: KCL

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
254-6-12	12F0342-01	Caulk	Red Duct Caulk	SW-846 8082A	
256-6-12	12F0342-02	Caulk	Red Duct Caulk	SW-846 8082A	
137-6-12	12F0342-03	Caulk	Red Duct Caulk	SW-846 8082A	

**CASE NARRATIVE SUMMARY**

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

**SW-846 8082A**

**Qualifications:**

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

**Analyte & Samples(s) Qualified:**

**Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C]**  
12F0342-01[254-6-12], 12F0342-02[256-6-12], 12F0342-03[137-6-12]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian  
Laboratory Manager

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: KCL

Sample Description: Red Duct Caulk

Work Order: 12F0342

Date Received: 6/11/2012

Field Sample #: 254-6-12

Sampled: 6/11/2012 00:00

Sample ID: 12F0342-01

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1221 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1232 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1242 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1248 [2]	37	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1254 [2]	100	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1260 [2]	66	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1262 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Aroclor-1268 [1]	ND	9.1	mg/Kg	50		SW-846 8082A	6/11/12	6/13/12 21:42	JMB
Surrogates	% Recovery		Recovery Limits		Flag				
Decachlorobiphenyl [1]	*		30-150		S-01		6/13/12 21:42		
Decachlorobiphenyl [2]	*		30-150		S-01		6/13/12 21:42		
Tetrachloro-m-xylene [1]	*		30-150		S-01		6/13/12 21:42		
Tetrachloro-m-xylene [2]	*		30-150		S-01		6/13/12 21:42		



Project Location: KCL

Sample Description: Red Duct Caulk

Work Order: 12F0342

Date Received: 6/11/2012

Field Sample #: 256-6-12

Sampled: 6/11/2012 00:00

Sample ID: 12F0342-02

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1221 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1232 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1242 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1248 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1254 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1260 [2]	560	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1262 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Aroclor-1268 [1]	ND	35	mg/Kg	200		SW-846 8082A	6/11/12	6/13/12 21:55	JMB
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			6/13/12 21:55	
Decachlorobiphenyl [2]	*	30-150			S-01			6/13/12 21:55	
Tetrachloro-m-xylene [1]	*	30-150			S-01			6/13/12 21:55	
Tetrachloro-m-xylene [2]	*	30-150			S-01			6/13/12 21:55	

Project Location: KCL

Sample Description: Red Duct Caulk

Work Order: 12F0342

Date Received: 6/11/2012

Field Sample #: 137-6-12

Sampled: 6/11/2012 00:00

Sample ID: 12F0342-03

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1221 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1232 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1242 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1248 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1254 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1260 [2]	3000	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1262 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Aroclor-1268 [1]	ND	190	mg/Kg	1000		SW-846 8082A	6/11/12	6/14/12 7:41	JMB
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			6/14/12 7:41	
Decachlorobiphenyl [2]	*	30-150			S-01			6/14/12 7:41	
Tetrachloro-m-xylene [1]	*	30-150			S-01			6/14/12 7:41	
Tetrachloro-m-xylene [2]	*	30-150			S-01			6/14/12 7:41	

### Sample Extraction Data

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12F0342-01 [254-6-12]	B053151	0.548	10.0	06/11/12
12F0342-02 [256-6-12]	B053151	0.565	10.0	06/11/12
12F0342-03 [137-6-12]	B053151	0.531	10.0	06/11/12

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B053151 - SW-846 3540C**
**Blank (B053151-BLK1)**

Prepared: 06/11/12 Analyzed: 06/13/12

Aroclor-1016	ND	0.20	mg/Kg							
Aroclor-1016 [2C]	ND	0.20	mg/Kg							
Aroclor-1221	ND	0.20	mg/Kg							
Aroclor-1221 [2C]	ND	0.20	mg/Kg							
Aroclor-1232	ND	0.20	mg/Kg							
Aroclor-1232 [2C]	ND	0.20	mg/Kg							
Aroclor-1242	ND	0.20	mg/Kg							
Aroclor-1242 [2C]	ND	0.20	mg/Kg							
Aroclor-1248	ND	0.20	mg/Kg							
Aroclor-1248 [2C]	ND	0.20	mg/Kg							
Aroclor-1254	ND	0.20	mg/Kg							
Aroclor-1254 [2C]	ND	0.20	mg/Kg							
Aroclor-1260	ND	0.20	mg/Kg							
Aroclor-1260 [2C]	ND	0.20	mg/Kg							
Aroclor-1262	ND	0.20	mg/Kg							
Aroclor-1262 [2C]	ND	0.20	mg/Kg							
Aroclor-1268	ND	0.20	mg/Kg							
Aroclor-1268 [2C]	ND	0.20	mg/Kg							
Surrogate: Decachlorobiphenyl	3.92		mg/Kg	4.00		97.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	4.01		mg/Kg	4.00		100	30-150			
Surrogate: Tetrachloro-m-xylene	4.17		mg/Kg	4.00		104	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	5.13		mg/Kg	4.00		128	30-150			

**LCS (B053151-BS1)**

Prepared: 06/11/12 Analyzed: 06/13/12

Aroclor-1016	3.7	0.20	mg/Kg	4.00		91.7	40-140			
Aroclor-1016 [2C]	4.5	0.20	mg/Kg	4.00		112	40-140			
Aroclor-1260	3.6	0.20	mg/Kg	4.00		89.9	40-140			
Aroclor-1260 [2C]	4.3	0.20	mg/Kg	4.00		107	40-140			
Surrogate: Decachlorobiphenyl	3.68		mg/Kg	4.00		92.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.61		mg/Kg	4.00		90.1	30-150			
Surrogate: Tetrachloro-m-xylene	4.34		mg/Kg	4.00		108	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	5.30		mg/Kg	4.00		133	30-150			

**LCS Dup (B053151-BSD1)**

Prepared: 06/11/12 Analyzed: 06/13/12

Aroclor-1016	3.6	0.20	mg/Kg	4.00		89.3	40-140	2.62	30	
Aroclor-1016 [2C]	4.3	0.20	mg/Kg	4.00		108	40-140	3.37	30	
Aroclor-1260	3.8	0.20	mg/Kg	4.00		94.3	40-140	4.80	30	
Aroclor-1260 [2C]	4.5	0.20	mg/Kg	4.00		112	40-140	4.76	30	
Surrogate: Decachlorobiphenyl	3.95		mg/Kg	4.00		98.7	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.98		mg/Kg	4.00		99.4	30-150			
Surrogate: Tetrachloro-m-xylene	3.90		mg/Kg	4.00		97.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	4.72		mg/Kg	4.00		118	30-150			

**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

**CERTIFICATIONS****Certified Analyses included in this Report****Analyte****Certifications****No certified Analyses included in this Report**

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2012
CT	Connecticut Department of Public Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2013
RI	Rhode Island Department of Health	LAO00112	12/30/2012
NC	North Carolina Div. of Water Quality	652	12/31/2012
NJ	New Jersey DEP	MA007 NELAP	06/30/2012
FL	Florida Department of Health	E871027 NELAP	06/30/2012
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2012
WA	State of Washington Department of Ecology	C2065	02/23/2013
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	1381	12/14/2012



Phone: 413-525-2332  
Fax: 413-525-6405  
Email: info@contestlabs.com  
www.contestlabs.com

# CHAIN OF CUSTODY RECORD

39 SPRUCE ST, 2ND FLOOR  
EAST LONGMEADOW, MA 01028

Page \_\_\_\_ of \_\_\_\_

Company Name:

WHE ETS

Address:

15 COLLEGE ST STE 100  
W. HAVEN, CT 06110

Attention:

STEVE MURDOCH

Project Location:

KCL

Sampled By:

S. MURDOCH

Proposal Provided? (For Billing purposes)

☐ yes ☐ no

proposal date

1250342

Telephone: 203 737-4453

Project #

KCL

Client PO #

DATA DELIVERY (check one):

☐ FAX ☒ EMAIL ☐ WEBSITE CLIENT

Fax #:

Email: Steven. Murdoch@kcl.com

Format: ☐ EXCEL ☐ PDF ☐ GIS KEY

PCB B082 Soxhlet  
3540C

## ANALYSIS REQUESTED

# of containers

\*\*Preservation

~Cont. Code

~Cont. Code:

A=amber glass

G=glass

P=plastic

ST=sterile

V= vial

S=summa can

T=ledlar bag

O=Other

Comments:

PCB B082 Soxhlet  
3540C

PCB B082 Soxhlet  
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PCB B082 Soxhlet  
3540C

PCB B082 Soxhlet  
3540C

## Turnaround

☐ 24 Hour\*

☐ 48 Hour\*

☐ 72 Hour\*

☒ 4 DAY

Other\*

Date needed\*\*

\*Require lab approval.

## Detection Limit Requirements

Regulations?

Data Enhancement Project? ☐ Y ☐ N

(MA MCP sites only)

Special Requirements or DL's:

## \*Matrix Code:

GW= groundwater

WW= wastewater

DW= drinking water

A= air

S= soil/solid

SL= sludge

O= other

## \*\*Preservation Codes:

I= iced

H= HCL

M= Methanol

N= Nitric Acid

S= Sulfuric Acid

B= Sodium bisulfate

O= Other

X= Na hydroxide

T= Na thiosulfate

Con-Test Laboratory is the ONLY independent laboratory in all of New England with both prestigious AIHA and NELAP Certifications!

4 DAY RESULTS FRI DAY

39 Spruce St.  
East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
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## Sample Receipt Checklist

CLIENT NAME: Yale EHS RECEIVED BY: SD DATE: 6/11/12

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples? Yes No  
If not, explain:

3) Are all the samples in good condition? Yes No  
If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 11.1

5) Are there Dissolved samples for the lab to filter? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No  
(Walk-in clients only) if not already approved  
Client Signature: \_\_\_\_\_

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

### Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	<u>3</u>
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_

Doc# 277 # Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_

Rev. 2 Sept 2011 # Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen:



July 6, 2012

George Franklin  
Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810

Project Location: Yale-KCL  
Client Job Number:  
Project Number: 225540  
Laboratory Work Order Number: 12F0964

Enclosed are results of analyses for samples received by the laboratory on June 27, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley  
Project Manager

Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810  
ATTN: George Franklin

REPORT DATE: 7/6/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 225540

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 12F0964

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Yale-KCL

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
KCL-CBK-036	12F0964-01	Caulk		SW-846 8082A	
KCL-CBK-037	12F0964-02	Caulk		SW-846 8082A	
KCL-CBK-038	12F0964-03	Caulk		SW-846 8082A	
KCL-CBK-039	12F0964-04	Caulk		SW-846 8082A	
KCL-CBB-040	12F0964-05	Brick		SW-846 8082A	
KCL-CBC-041	12F0964-06	Concrete		SW-846 8082A	
KCL-VBC-042	12F0964-07	Concrete		SW-846 8082A	
KCL-VBC-043	12F0964-08	Concrete		SW-846 8082A	
KCL-VWP-044	12F0964-09	Wipe		SW-846 8082A	
KCL-VWP-045	12F0964-10	Wipe		SW-846 8082A	
KCL-VWP-046	12F0964-11	Wipe		SW-846 8082A	
KCL-VBC-047	12F0964-12	Concrete		SW-846 8082A	
KCL-VBC-048	12F0964-13	Concrete		SW-846 8082A	
KCL-VBC-049	12F0964-14	Concrete		SW-846 8082A	
KCL-VBC-050	12F0964-15	Concrete		SW-846 8082A	
KCL-VBC-051	12F0964-16	Concrete		SW-846 8082A	
KCL-VBB-052	12F0964-17	Brick		SW-846 8082A	
KCL-VBB-053	12F0964-18	Brick		SW-846 8082A	
KCL-VBBD-054	12F0964-19	Brick		SW-846 8082A	
KCL-VBBQ-055	12F0964-20	Equipment Blank Water		SW-846 8082A	

## CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

**SW-846 8082A**

### Qualifications:

---

Analyte is found in the associated blank as well as in the sample.

### Analyte & Samples(s) Qualified:

**Aroclor-1254, Aroclor-1254 [2C]**

12F0964-01[KCL-CBK-036], 12F0964-02[KCL-CBK-037], 12F0964-03[KCL-CBK-038]

---

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

### Analyte & Samples(s) Qualified:

**Aroclor-1254, Aroclor-1254 [2C]**

12F0964-01[KCL-CBK-036], 12F0964-02[KCL-CBK-037], 12F0964-03[KCL-CBK-038]

---

Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.

### Analyte & Samples(s) Qualified:

**Aroclor-1260, Aroclor-1260 [2C]**

12F0964-08[KCL-VBC-043]

---

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

### Analyte & Samples(s) Qualified:

**Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C]**

12F0964-01[KCL-CBK-036], 12F0964-02[KCL-CBK-037]

---

Continuing calibration verification was outside of control limits on the confirmation column, but within control limits on the primary column.

All sample results are reported from the column within control criteria.

### Analyte & Samples(s) Qualified:

**Aroclor-1016 [2C], Aroclor-1260 [2C]**

12F0964-01[KCL-CBK-036], 12F0964-02[KCL-CBK-037], 12F0964-03[KCL-CBK-038], B054247-BS1, B054247-BSD1, B054542-BS1, B054542-BSD1

---

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "M. Erickson", is displayed on a light gray rectangular background.

Michael A. Erickson  
Laboratory Director

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-CBK-036

Sampled: 6/26/2012 12:35

Sample ID: 12F0964-01

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1221 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1232 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1242 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1248 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1254 [2]	60	9.0	mg/Kg	50	B-07, B	SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1260 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1262 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Aroclor-1268 [1]	ND	9.0	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:34	MJC
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			7/3/12 15:34	
Decachlorobiphenyl [2]	*	30-150			S-01			7/3/12 15:34	
Tetrachloro-m-xylene [1]	*	30-150			S-01			7/3/12 15:34	
Tetrachloro-m-xylene [2]	*	30-150			S-01			7/3/12 15:34	

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-CBK-037

Sampled: 6/26/2012 12:40

Sample ID: 12F0964-02

Sample Matrix: Caulk

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1221 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1232 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1242 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1248 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1254 [2]	61	8.6	mg/Kg	50	B-07, B	SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1260 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1262 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Aroclor-1268 [1]	ND	8.6	mg/Kg	50		SW-846 8082A	6/28/12	7/3/12 15:47	MJC
Surrogates	% Recovery	Recovery Limits			Flag				
Decachlorobiphenyl [1]	*	30-150			S-01			7/3/12 15:47	
Decachlorobiphenyl [2]	*	30-150			S-01			7/3/12 15:47	
Tetrachloro-m-xylene [1]	*	30-150			S-01			7/3/12 15:47	
Tetrachloro-m-xylene [2]	*	30-150			S-01			7/3/12 15:47	

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-CBK-038

Sampled: 6/26/2012 12:50

Sample ID: 12F0964-03

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1221 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1232 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1242 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1248 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1254 [2]	31	3.6	mg/Kg	20	B-07, B	SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1260 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1262 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Aroclor-1268 [1]	ND	3.6	mg/Kg	20		SW-846 8082A	6/28/12	7/3/12 16:00	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	75.1	30-150						7/3/12 16:00	
Decachlorobiphenyl [2]	96.7	30-150						7/3/12 16:00	
Tetrachloro-m-xylene [1]	99.9	30-150						7/3/12 16:00	
Tetrachloro-m-xylene [2]	126	30-150						7/3/12 16:00	

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-CBK-039

Sampled: 6/26/2012 12:55

Sample ID: 12F0964-04

Sample Matrix: Caulk

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1221 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1232 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1242 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1248 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1254 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1260 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1262 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Aroclor-1268 [1]	ND	0.87	mg/Kg	5		SW-846 8082A	7/5/12	7/6/12 10:53	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	121	30-150						7/6/12 10:53	
Decachlorobiphenyl [2]	107	30-150						7/6/12 10:53	
Tetrachloro-m-xylene [1]	118	30-150						7/6/12 10:53	
Tetrachloro-m-xylene [2]	116	30-150						7/6/12 10:53	



Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-CBB-040

Sampled: 6/26/2012 13:10

Sample ID: 12F0964-05

Sample Matrix: Brick

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1221 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1232 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1242 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1248 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1254 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1260 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1262 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Aroclor-1268 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:34	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	104	30-150							
Decachlorobiphenyl [2]	93.6	30-150							
Tetrachloro-m-xylene [1]	90.7	30-150							
Tetrachloro-m-xylene [2]	94.2	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-CBC-041

Sampled: 6/26/2012 13:50

Sample ID: 12F0964-06

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1254 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1260 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 13:47	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	105	30-150							
Decachlorobiphenyl [2]	94.4	30-150							
Tetrachloro-m-xylene [1]	88.5	30-150							
Tetrachloro-m-xylene [2]	92.5	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-042

Sampled: 6/26/2012 14:38

Sample ID: 12F0964-07

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1221 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1232 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1242 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1248 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1254 [2]	2.8	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1260 [2]	1.7	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1262 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Aroclor-1268 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:15	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	129	30-150							
Decachlorobiphenyl [2]	113	30-150							
Tetrachloro-m-xylene [1]	94.4	30-150							
Tetrachloro-m-xylene [2]	96.2	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-043

Sampled: 6/26/2012 14:45

Sample ID: 12F0964-08

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1254 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1260 [1]	1.1	0.087	mg/Kg	1	O-03	SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 14:52	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	82.0	30-150							
Decachlorobiphenyl [2]	72.8	30-150							
Tetrachloro-m-xylene [1]	68.0	30-150							
Tetrachloro-m-xylene [2]	71.6	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VWP-044

Sampled: 6/26/2012 15:00

Sample ID: 12F0964-09

Sample Matrix: Wipe

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1260 [1]	0.34	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 20:53	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	118	30-150							
Decachlorobiphenyl [2]	109	30-150							
Tetrachloro-m-xylene [1]	103	30-150							
Tetrachloro-m-xylene [2]	107	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VWP-045

Sampled: 6/26/2012 15:05

Sample ID: 12F0964-10

Sample Matrix: Wipe

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:05	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	117	30-150							
Decachlorobiphenyl [2]	107	30-150							
Tetrachloro-m-xylene [1]	102	30-150							
Tetrachloro-m-xylene [2]	106	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VWP-046

Sampled: 6/26/2012 15:15

Sample ID: 12F0964-11

Sample Matrix: Wipe

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/28/12	6/29/12 21:18	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	113	30-150							
Decachlorobiphenyl [2]	102	30-150							
Tetrachloro-m-xylene [1]	102	30-150							
Tetrachloro-m-xylene [2]	106	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-047

Sampled: 6/26/2012 15:30

Sample ID: 12F0964-12

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1221 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1232 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1242 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1248 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1254 [2]	0.29	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1260 [1]	0.46	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1262 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Aroclor-1268 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:05	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	126	30-150							
Decachlorobiphenyl [2]	112	30-150							
Tetrachloro-m-xylene [1]	96.0	30-150							
Tetrachloro-m-xylene [2]	99.8	30-150							



Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-048

Sampled: 6/26/2012 15:50

Sample ID: 12F0964-13

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1221 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1232 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1242 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1248 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1254 [2]	1.1	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1260 [1]	0.36	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1262 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Aroclor-1268 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 15:18	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	126	30-150							
Decachlorobiphenyl [2]	113	30-150							
Tetrachloro-m-xylene [1]	99.4	30-150							
Tetrachloro-m-xylene [2]	104	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-049

Sampled: 6/26/2012 16:00

Sample ID: 12F0964-14

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1221 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1232 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1242 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1248 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1254 [2]	3.3	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1260 [1]	0.82	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1262 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Aroclor-1268 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:28	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	125	30-150							
Decachlorobiphenyl [2]	110	30-150							
Tetrachloro-m-xylene [1]	92.6	30-150							
Tetrachloro-m-xylene [2]	94.6	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-050

Sampled: 6/26/2012 16:20

Sample ID: 12F0964-15

Sample Matrix: Concrete

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1221 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1232 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1242 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1248 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1254 [2]	1.1	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1260 [2]	0.40	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1262 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Aroclor-1268 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	6/28/12	7/1/12 6:41	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	126	30-150							
Decachlorobiphenyl [2]	110	30-150							
Tetrachloro-m-xylene [1]	96.2	30-150							
Tetrachloro-m-xylene [2]	99.3	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBC-051

Sampled: 6/26/2012 16:30

Sample ID: 12F0964-16

Sample Matrix: Concrete

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1221 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1232 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1242 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1248 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1254 [2]	3.6	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1260 [2]	0.82	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1262 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Aroclor-1268 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	6/28/12	7/1/12 6:54	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	132	30-150							
Decachlorobiphenyl [2]	117	30-150							
Tetrachloro-m-xylene [1]	99.4	30-150							
Tetrachloro-m-xylene [2]	100	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBB-052

Sampled: 6/26/2012 16:40

Sample ID: 12F0964-17

Sample Matrix: Brick

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1221 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1232 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1242 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1248 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1254 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1260 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1262 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Aroclor-1268 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:10	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	130	30-150							
Decachlorobiphenyl [2]	116	30-150							
Tetrachloro-m-xylene [1]	108	30-150							
Tetrachloro-m-xylene [2]	111	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBB-053

Sampled: 6/26/2012 16:50

Sample ID: 12F0964-18

Sample Matrix: Brick

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1221 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1232 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1242 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1248 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1254 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1260 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1262 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Aroclor-1268 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:23	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	107	30-150							
Decachlorobiphenyl [2]	95.2	30-150							
Tetrachloro-m-xylene [1]	93.3	30-150							
Tetrachloro-m-xylene [2]	96.3	30-150							

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBBD-054

Sampled: 6/26/2012 16:50

Sample ID: 12F0964-19

Sample Matrix: Brick

### Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1254 [2]	0.10	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1260 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	6/28/12	6/30/12 16:35	MJC
Surrogates	% Recovery		Recovery Limits		Flag				
Decachlorobiphenyl [1]	110		30-150				6/30/12 16:35		
Decachlorobiphenyl [2]	98.0		30-150				6/30/12 16:35		
Tetrachloro-m-xylene [1]	95.5		30-150				6/30/12 16:35		
Tetrachloro-m-xylene [2]	98.2		30-150				6/30/12 16:35		

Project Location: Yale-KCL

Sample Description:

Work Order: 12F0964

Date Received: 6/27/2012

Field Sample #: KCL-VBBQ-055

Sampled: 6/26/2012 17:00

Sample ID: 12F0964-20

Sample Matrix: Equipment Blank Water

### Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1221 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1232 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1242 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1248 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1254 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1260 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1262 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Aroclor-1268 [1]	ND	0.20	µg/L	1		SW-846 8082A	6/29/12	6/29/12 16:20	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	71.4	30-150							
Decachlorobiphenyl [2]	63.7	30-150							
Tetrachloro-m-xylene [1]	78.1	30-150							
Tetrachloro-m-xylene [2]	81.6	30-150							



**Sample Extraction Data****Prep Method: SW-846 3540C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12F0964-01 [KCL-CBK-036]	B054247	0.557	10.0	06/28/12
12F0964-02 [KCL-CBK-037]	B054247	0.579	10.0	06/28/12
12F0964-03 [KCL-CBK-038]	B054247	0.562	10.0	06/28/12

**Prep Method: SW-846 3540C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12F0964-04RE1 [KCL-CBK-039]	B054542	0.572	10.0	07/05/12

**Prep Method: SW-846 3540C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12F0964-05 [KCL-CBB-040]	B054248	2.10	10.0	06/28/12
12F0964-06 [KCL-CBC-041]	B054248	2.30	10.0	06/28/12
12F0964-07 [KCL-VBC-042]	B054248	2.30	10.0	06/28/12
12F0964-08 [KCL-VBC-043]	B054248	2.30	10.0	06/28/12
12F0964-12 [KCL-VBC-047]	B054248	2.10	10.0	06/28/12
12F0964-13 [KCL-VBC-048]	B054248	2.10	10.0	06/28/12
12F0964-14 [KCL-VBC-049]	B054248	2.20	10.0	06/28/12
12F0964-15 [KCL-VBC-050]	B054248	2.20	10.0	06/28/12
12F0964-16 [KCL-VBC-051]	B054248	2.20	10.0	06/28/12
12F0964-17 [KCL-VBB-052]	B054248	2.20	10.0	06/28/12
12F0964-18 [KCL-VBB-053]	B054248	2.20	10.0	06/28/12
12F0964-19 [KCL-VBBD-054]	B054248	2.30	10.0	06/28/12

**Prep Method: SW-846 3510C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
12F0964-20 [KCL-VBBQ-055]	B054269	1000	10.0	06/29/12

**Prep Method: SW-846 3540C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [Wipe]	Final [mL]	Date
12F0964-09 [KCL-VWP-044]	B054234	1.00	10.0	06/28/12
12F0964-10 [KCL-VWP-045]	B054234	1.00	10.0	06/28/12
12F0964-11 [KCL-VWP-046]	B054234	1.00	10.0	06/28/12

**QUALITY CONTROL**
**Polychlorinated Biphenyls By GC/ECD - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B054269 - SW-846 3510C</b>										
<b>Blank (B054269-BLK1)</b>										
Prepared & Analyzed: 06/29/12										
Aroclor-1016	ND	0.20	µg/L							
Aroclor-1016 [2C]	ND	0.20	µg/L							
Aroclor-1221	ND	0.20	µg/L							
Aroclor-1221 [2C]	ND	0.20	µg/L							
Aroclor-1232	ND	0.20	µg/L							
Aroclor-1232 [2C]	ND	0.20	µg/L							
Aroclor-1242	ND	0.20	µg/L							
Aroclor-1242 [2C]	ND	0.20	µg/L							
Aroclor-1248	ND	0.20	µg/L							
Aroclor-1248 [2C]	ND	0.20	µg/L							
Aroclor-1254	ND	0.20	µg/L							
Aroclor-1254 [2C]	ND	0.20	µg/L							
Aroclor-1260	ND	0.20	µg/L							
Aroclor-1260 [2C]	ND	0.20	µg/L							
Aroclor-1262	ND	0.20	µg/L							
Aroclor-1262 [2C]	ND	0.20	µg/L							
Aroclor-1268	ND	0.20	µg/L							
Aroclor-1268 [2C]	ND	0.20	µg/L							
Surrogate: Decachlorobiphenyl	1.47		µg/L	2.00		73.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.28		µg/L	2.00		64.0	30-150			
Surrogate: Tetrachloro-m-xylene	1.42		µg/L	2.00		71.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.48		µg/L	2.00		73.9	30-150			
<b>LCS (B054269-BS1)</b>										
Prepared & Analyzed: 06/29/12										
Aroclor-1016	0.44	0.20	µg/L	0.500		88.7	40-140			
Aroclor-1016 [2C]	0.42	0.20	µg/L	0.500		84.8	40-140			
Aroclor-1260	0.35	0.20	µg/L	0.500		71.0	40-140			
Aroclor-1260 [2C]	0.38	0.20	µg/L	0.500		75.0	40-140			
Surrogate: Decachlorobiphenyl	1.59		µg/L	2.00		79.5	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.41		µg/L	2.00		70.3	30-150			
Surrogate: Tetrachloro-m-xylene	1.42		µg/L	2.00		71.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.47		µg/L	2.00		73.4	30-150			
<b>LCS Dup (B054269-BSD1)</b>										
Prepared & Analyzed: 06/29/12										
Aroclor-1016	0.49	0.20	µg/L	0.500		97.6	40-140	9.62	20	
Aroclor-1016 [2C]	0.47	0.20	µg/L	0.500		94.0	40-140	10.2	20	
Aroclor-1260	0.41	0.20	µg/L	0.500		82.7	40-140	15.3	20	
Aroclor-1260 [2C]	0.43	0.20	µg/L	0.500		86.0	40-140	13.6	20	
Surrogate: Decachlorobiphenyl	1.65		µg/L	2.00		82.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.46		µg/L	2.00		73.0	30-150			
Surrogate: Tetrachloro-m-xylene	1.52		µg/L	2.00		76.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.58		µg/L	2.00		79.0	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B054234 - SW-846 3540C**
**Blank (B054234-BLK1)**

Prepared: 06/28/12 Analyzed: 06/29/12

Aroclor-1016	ND	0.20	µg/Wipe							
Aroclor-1016 [2C]	ND	0.20	µg/Wipe							
Aroclor-1221	ND	0.20	µg/Wipe							
Aroclor-1221 [2C]	ND	0.20	µg/Wipe							
Aroclor-1232	ND	0.20	µg/Wipe							
Aroclor-1232 [2C]	ND	0.20	µg/Wipe							
Aroclor-1242	ND	0.20	µg/Wipe							
Aroclor-1242 [2C]	ND	0.20	µg/Wipe							
Aroclor-1248	ND	0.20	µg/Wipe							
Aroclor-1248 [2C]	ND	0.20	µg/Wipe							
Aroclor-1254	ND	0.20	µg/Wipe							
Aroclor-1254 [2C]	ND	0.20	µg/Wipe							
Aroclor-1260	ND	0.20	µg/Wipe							
Aroclor-1260 [2C]	ND	0.20	µg/Wipe							
Aroclor-1262	ND	0.20	µg/Wipe							
Aroclor-1262 [2C]	ND	0.20	µg/Wipe							
Aroclor-1268	ND	0.20	µg/Wipe							
Aroclor-1268 [2C]	ND	0.20	µg/Wipe							
Surrogate: Decachlorobiphenyl	2.71		µg/Wipe	2.00		136	30-150			
Surrogate: Decachlorobiphenyl [2C]	2.45		µg/Wipe	2.00		122	30-150			
Surrogate: Tetrachloro-m-xylene	2.37		µg/Wipe	2.00		119	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	2.47		µg/Wipe	2.00		124	30-150			

**LCS (B054234-BS1)**

Prepared: 06/28/12 Analyzed: 06/29/12

Aroclor-1016	0.42	0.20	µg/Wipe	0.500		84.6	40-140			
Aroclor-1016 [2C]	0.42	0.20	µg/Wipe	0.500		84.7	40-140			
Aroclor-1260	0.41	0.20	µg/Wipe	0.500		81.8	40-140			
Aroclor-1260 [2C]	0.43	0.20	µg/Wipe	0.500		85.1	40-140			
Surrogate: Decachlorobiphenyl	1.80		µg/Wipe	2.00		90.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.61		µg/Wipe	2.00		80.6	30-150			
Surrogate: Tetrachloro-m-xylene	1.44		µg/Wipe	2.00		72.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.50		µg/Wipe	2.00		75.1	30-150			

**LCS Dup (B054234-BSD1)**

Prepared: 06/28/12 Analyzed: 06/29/12

Aroclor-1016	0.53	0.20	µg/Wipe	0.500		106	40-140	22.3	30	
Aroclor-1016 [2C]	0.52	0.20	µg/Wipe	0.500		105	40-140	21.0	30	
Aroclor-1260	0.51	0.20	µg/Wipe	0.500		101	40-140	21.4	30	
Aroclor-1260 [2C]	0.53	0.20	µg/Wipe	0.500		107	40-140	22.7	30	
Surrogate: Decachlorobiphenyl	2.23		µg/Wipe	2.00		112	30-150			
Surrogate: Decachlorobiphenyl [2C]	2.00		µg/Wipe	2.00		100	30-150			
Surrogate: Tetrachloro-m-xylene	1.85		µg/Wipe	2.00		92.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.93		µg/Wipe	2.00		96.5	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B054247 - SW-846 3540C**
**Blank (B054247-BLK1)**

Prepared: 06/28/12 Analyzed: 07/03/12

Aroclor-1016	ND	0.20	mg/Kg							
Aroclor-1016 [2C]	ND	0.20	mg/Kg							
Aroclor-1221	ND	0.20	mg/Kg							
Aroclor-1221 [2C]	ND	0.20	mg/Kg							
Aroclor-1232	ND	0.20	mg/Kg							
Aroclor-1232 [2C]	ND	0.20	mg/Kg							
Aroclor-1242	ND	0.20	mg/Kg							
Aroclor-1242 [2C]	ND	0.20	mg/Kg							
Aroclor-1248	ND	0.20	mg/Kg							
Aroclor-1248 [2C]	ND	0.20	mg/Kg							
Aroclor-1254	0.77	0.20	mg/Kg							
Aroclor-1254 [2C]	0.87	0.20	mg/Kg							
Aroclor-1260	ND	0.20	mg/Kg							
Aroclor-1260 [2C]	ND	0.20	mg/Kg							
Aroclor-1262	ND	0.20	mg/Kg							
Aroclor-1262 [2C]	ND	0.20	mg/Kg							
Aroclor-1268	ND	0.20	mg/Kg							
Aroclor-1268 [2C]	ND	0.20	mg/Kg							
Surrogate: Decachlorobiphenyl	3.24		mg/Kg	4.00		81.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.81		mg/Kg	4.00		95.2	30-150			
Surrogate: Tetrachloro-m-xylene	3.83		mg/Kg	4.00		95.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	4.24		mg/Kg	4.00		106	30-150			

**LCS (B054247-BS1)**

Prepared: 06/28/12 Analyzed: 07/03/12

Aroclor-1016	3.4	0.20	mg/Kg	4.00		84.8	40-140			
Aroclor-1016 [2C]	4.5	0.20	mg/Kg	4.00		113	40-140			V-24
Aroclor-1260	2.9	0.20	mg/Kg	4.00		73.4	40-140			
Aroclor-1260 [2C]	3.4	0.20	mg/Kg	4.00		84.5	40-140			
Surrogate: Decachlorobiphenyl	2.57		mg/Kg	4.00		64.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.15		mg/Kg	4.00		78.7	30-150			
Surrogate: Tetrachloro-m-xylene	3.71		mg/Kg	4.00		92.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.99		mg/Kg	4.00		99.7	30-150			

**LCS Dup (B054247-BSD1)**

Prepared: 06/28/12 Analyzed: 07/03/12

Aroclor-1016	3.4	0.20	mg/Kg	4.00		85.2	40-140	0.498	30	
Aroclor-1016 [2C]	4.3	0.20	mg/Kg	4.00		107	40-140	4.99	30	V-24
Aroclor-1260	2.7	0.20	mg/Kg	4.00		66.9	40-140	9.15	30	
Aroclor-1260 [2C]	3.0	0.20	mg/Kg	4.00		75.6	40-140	11.1	30	
Surrogate: Decachlorobiphenyl	1.98		mg/Kg	4.00		49.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	2.40		mg/Kg	4.00		60.0	30-150			
Surrogate: Tetrachloro-m-xylene	3.67		mg/Kg	4.00		91.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.97		mg/Kg	4.00		99.3	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B054248 - SW-846 3540C**
**Blank (B054248-BLK1)**

Prepared: 06/28/12 Analyzed: 06/30/12

Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	1.21		mg/Kg	1.00		121	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.05		mg/Kg	1.00		105	30-150			
Surrogate: Tetrachloro-m-xylene	0.909		mg/Kg	1.00		90.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.936		mg/Kg	1.00		93.6	30-150			

**LCS (B054248-BS1)**

Prepared: 06/28/12 Analyzed: 06/30/12

Aroclor-1016	0.26	0.10	mg/Kg	0.250		104	40-140			
Aroclor-1016 [2C]	0.27	0.10	mg/Kg	0.250		107	40-140			
Aroclor-1260	0.28	0.10	mg/Kg	0.250		110	40-140			
Aroclor-1260 [2C]	0.28	0.10	mg/Kg	0.250		111	40-140			
Surrogate: Decachlorobiphenyl	1.16		mg/Kg	1.00		116	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.02		mg/Kg	1.00		102	30-150			
Surrogate: Tetrachloro-m-xylene	0.918		mg/Kg	1.00		91.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.949		mg/Kg	1.00		94.9	30-150			

**LCS Dup (B054248-BSD1)**

Prepared: 06/28/12 Analyzed: 06/30/12

Aroclor-1016	0.26	0.10	mg/Kg	0.250		103	40-140	1.21	30	
Aroclor-1016 [2C]	0.28	0.10	mg/Kg	0.250		111	40-140	2.83	30	
Aroclor-1260	0.27	0.10	mg/Kg	0.250		107	40-140	2.63	30	
Aroclor-1260 [2C]	0.28	0.10	mg/Kg	0.250		111	40-140	0.305	30	
Surrogate: Decachlorobiphenyl	1.11		mg/Kg	1.00		111	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.983		mg/Kg	1.00		98.3	30-150			
Surrogate: Tetrachloro-m-xylene	0.944		mg/Kg	1.00		94.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.978		mg/Kg	1.00		97.8	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B054542 - SW-846 3540C**
**Blank (B054542-BLK1)**

Prepared: 07/05/12 Analyzed: 07/06/12

Aroclor-1016	ND	0.20	mg/Kg							
Aroclor-1016 [2C]	ND	0.20	mg/Kg							
Aroclor-1221	ND	0.20	mg/Kg							
Aroclor-1221 [2C]	ND	0.20	mg/Kg							
Aroclor-1232	ND	0.20	mg/Kg							
Aroclor-1232 [2C]	ND	0.20	mg/Kg							
Aroclor-1242	ND	0.20	mg/Kg							
Aroclor-1242 [2C]	ND	0.20	mg/Kg							
Aroclor-1248	ND	0.20	mg/Kg							
Aroclor-1248 [2C]	ND	0.20	mg/Kg							
Aroclor-1254	ND	0.20	mg/Kg							
Aroclor-1254 [2C]	ND	0.20	mg/Kg							
Aroclor-1260	ND	0.20	mg/Kg							
Aroclor-1260 [2C]	ND	0.20	mg/Kg							
Aroclor-1262	ND	0.20	mg/Kg							
Aroclor-1262 [2C]	ND	0.20	mg/Kg							
Aroclor-1268	ND	0.20	mg/Kg							
Aroclor-1268 [2C]	ND	0.20	mg/Kg							
Surrogate: Decachlorobiphenyl	4.33		mg/Kg	4.00		108	30-150			
Surrogate: Decachlorobiphenyl [2C]	4.47		mg/Kg	4.00		112	30-150			
Surrogate: Tetrachloro-m-xylene	4.25		mg/Kg	4.00		106	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.98		mg/Kg	4.00		99.6	30-150			

**LCS (B054542-BS1)**

Prepared: 07/05/12 Analyzed: 07/06/12

Aroclor-1016	4.0	0.20	mg/Kg	4.00		99.4	40-140			
Aroclor-1016 [2C]	3.9	0.20	mg/Kg	4.00		98.0	40-140			V-24
Aroclor-1260	4.0	0.20	mg/Kg	4.00		100	40-140			
Aroclor-1260 [2C]	3.8	0.20	mg/Kg	4.00		94.9	40-140			V-24
Surrogate: Decachlorobiphenyl	4.40		mg/Kg	4.00		110	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.83		mg/Kg	4.00		95.9	30-150			
Surrogate: Tetrachloro-m-xylene	4.28		mg/Kg	4.00		107	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.97		mg/Kg	4.00		99.4	30-150			

**LCS Dup (B054542-BSD1)**

Prepared: 07/05/12 Analyzed: 07/06/12

Aroclor-1016	4.4	0.20	mg/Kg	4.00		110	40-140	9.96	30	
Aroclor-1016 [2C]	4.2	0.20	mg/Kg	4.00		106	40-140	7.92	30	V-24
Aroclor-1260	4.1	0.20	mg/Kg	4.00		103	40-140	2.93	30	
Aroclor-1260 [2C]	3.9	0.20	mg/Kg	4.00		98.3	40-140	3.45	30	V-24
Surrogate: Decachlorobiphenyl	4.25		mg/Kg	4.00		106	30-150			
Surrogate: Decachlorobiphenyl [2C]	4.44		mg/Kg	4.00		111	30-150			
Surrogate: Tetrachloro-m-xylene	4.44		mg/Kg	4.00		111	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	4.18		mg/Kg	4.00		104	30-150			

**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B	Analyte is found in the associated blank as well as in the sample.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
O-03	Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
V-24	Continuing calibration verification was outside of control limits on the confirmation column, but within control limits on the primary column. All sample results are reported from the column within control criteria.

# CERTIFICATIONS

## Certified Analyses included in this Report

Analyte	Certifications
<b><i>SW-846 8082A in Product/Solid</i></b>	
Aroclor-1016	CT,NH,NY,ME,NC
Aroclor-1016 [2C]	CT,NH,NY,ME,NC
Aroclor-1221	CT,NH,NY,ME,NC
Aroclor-1221 [2C]	CT,NH,NY,ME,NC
Aroclor-1232	CT,NH,NY,ME,NC
Aroclor-1232 [2C]	CT,NH,NY,ME,NC
Aroclor-1242	CT,NH,NY,ME,NC
Aroclor-1242 [2C]	CT,NH,NY,ME,NC
Aroclor-1248	CT,NH,NY,ME,NC
Aroclor-1248 [2C]	CT,NH,NY,ME,NC
Aroclor-1254	CT,NH,NY,ME,NC
Aroclor-1254 [2C]	CT,NH,NY,ME,NC
Aroclor-1260	CT,NH,NY,ME,NC
Aroclor-1260 [2C]	CT,NH,NY,ME,NC
<b><i>SW-846 8082A in Water</i></b>	
Aroclor-1016	CT,NH,NY,RI,NC,ME
Aroclor-1016 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1221	CT,NH,NY,RI,NC,ME
Aroclor-1221 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1232	CT,NH,NY,RI,NC,ME
Aroclor-1232 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1242	CT,NH,NY,RI,NC,ME
Aroclor-1242 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1248	CT,NH,NY,RI,NC,ME
Aroclor-1248 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1254	CT,NH,NY,RI,NC,ME
Aroclor-1254 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1260	CT,NH,NY,RI,NC,ME
Aroclor-1260 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1262	NC
Aroclor-1262 [2C]	NC
Aroclor-1268	NC
Aroclor-1268 [2C]	NC



The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Public Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2013
RI	Rhode Island Department of Health	LAO00112	12/30/2012
NC	North Carolina Div. of Water Quality	652	12/31/2012
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2012
WA	State of Washington Department of Ecology	C2065	02/23/2013
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	1381	12/14/2012



**con-test**  
ANALYTICAL LABORATORY

Phone: 413-525-2332  
Fax: 413-525-6405  
Email: info@contestlabs.com  
www.contestlabs.com

**CHAIN OF CUSTODY RECORD**

39 Spruce Street  
East Longmeadow, MA 01028

Page 1 of 2

Company Name: WOODWARD & LOREAN

Telephone: 978-551-8150

Address: 35 NE BUS. CTR SUITE 180

ANDER MA

Project # 225310

Attention: GEORGE FRANKLIN

Project Location: YALE - KCL

Sampled By: GEORGE FRANKLIN

Project Proposal Provided? (for billing purposes)  
☐ Yes ☐ No  
proposal date

Client PO#

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Fax #

Email: gfranklin

Format: ☒ PDF ☐ EXCEL ☐ OGIS

Other

Collection  
Beginning Date/Time Ending Date/Time  
☐ "Enhanced Data Package"

Con-Test Lab ID Client Sample ID / Description

Beginning Date/Time Ending Date/Time

Composite Grab

\*Matrix  
Date

Lab

PCBs (8002)

POTENTIALLY VERY HIGH

ANALYSIS REQUESTED

Field Filtered

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**con-test**  
ANALYTICAL LABORATORY

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www.contestlabs.com

**CHAIN OF CUSTODY RECORD**

39 Spruce Street  
East Longmeadow, MA 01028

Page 2 of 2

Company Name: Woodsboro, VT (Vermont)

Telephone: 978 557 8150

Address: 35 NE Bys. Ctr Drive Suite 180

Project # 225540

Attention: George Franklin

Client PO#

Project Location: Vane - KCL

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Sampled By: GEORGE FRANKLIN

Email: gfranklin

Project Proposal Provided? (for billing purposes)

Format: PDF ☒ EXCEL ☐ OGIS  
☐ OTHER

Project Proposal Provided? (for billing purposes)  
☐ Yes ☐ No

Con-Test Lab ID

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Composite

Grab

\*Matrix

Conc. Code

Analysis Requested

# of Containers

\*\* Preservation

\*\*\* Container Code

11 KCL-VWR-046

6/26/12

1515

X

W

U

X

12 KCL-VBC-047

6/26/12

1530

X

W

U

X

13 KCL-VBC-048

6/26/12

1550

X

S

U

X

14 KCL-VBC-049

6/26/12

1600

X

S

U

X

15 KCL-VBC-050

6/26/12

1620

X

S

U

X

16 KCL-VBC-051

6/26/12

1630

X

S

U

X

17 KCL-VBC-052

6/26/12

1640

X

S

U

X

18 KCL-VBC-053

6/26/12

1650

X

S

U

X

19 KCL-VBC-054

6/26/12

1650

X

S

U

X

20 KCL-VBC-055

6/26/12

1700

X

S

U

X

Comments: PCBs via USEPA 8082 v1 Soxhlet Extraction

Relinquished by: (signature) 6/27/12 (17)

Received by: (signature) 6/27/12

Relinquished by: (signature) 6/27/12

Received by: (signature) 6/27/12

Relinquished by: (signature) 6/27/12

Received by: (signature) 6/27/12

Relinquished by: (signature) 6/27/12

Relinquished by: (signature) 6/27/12

Relinquished by: (signature) 6/27/12

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

Is your project MCP or RCP?

MCP Form Required

RCP Form Required

MA State DW Form Required

PWSID #

Accredited

WBE/DBE Certified

Disinfectant

Field Filtered

Lab to Filter

\*\*\*Cont. Code:

A=amber glass

G=glass

P=plastic

ST=sterile

V=vial

S=summary can

T=tedlar bag

O=Other

\*\*\*Preservation

I=iced

H=HCL

M=Methanol

N=Nitric Acid

S=Sulfuric Acid

B=Sodium bisulfate

X=Na hydroxide

T=Na thiosulfate

O=Other

\*\*\*Matrix Code:

GW=groundwater

WW=wastewater

DW=drinking water

A=air

S=soil/solid

SL=sludge

39 Spruce St.  
East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
www.contestlabs.com



## Sample Receipt Checklist

CLIENT NAME: Woodard & Curran RECEIVED BY: CB DATE: 6/27/12

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples?

If not, explain:

3) Are all the samples in good condition?

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 3.3

5) Are there Dissolved samples for the lab to filter?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No

(Walk-in clients only) if not already approved

Client Signature: \_\_\_\_\_

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No N/A

### Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber	<u>1</u>	8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	<u>19</u>
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_

Doc# 277 # Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_

Rev. 3 May 2012 # Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen:

**12F0948-01** C-01

Analyte	Results		%RPD
Surrogates			
Tetrachloro-m-xylene	0.807	0.8367318	3.62
Decachlorobiphenyl	0.962	0.8525318	12.1

**12F0964-01** KCL-CBK-036

Analyte	Results		%RPD
Aroclor-1254 [2C]	60	52.41921	13.5

**12F0964-02** KCL-CBK-037

Analyte	Results		%RPD
Aroclor-1254 [2C]	61	53.42055	13.2

**12F0964-03** KCL-CBK-038

Analyte	Results		%RPD
Aroclor-1254 [2C]	31	27.5726	11.7
Surrogates			
Decachlorobiphenyl	2.67	3.439858	25.2
Tetrachloro-m-xylene	3.56	4.468684	22.6

**12F0964-04RE1** KCL-CBK-039

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	4.23	3.730419	12.6
Tetrachloro-m-xylene	4.13	4.073164	1.39

**12F0964-05** KCL-CBB-040

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	0.994	0.8916905	10.9
Tetrachloro-m-xylene	0.863	0.8969524	3.86

**12F0964-06** KCL-CBC-041

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	0.915	0.8208391	10.8
Tetrachloro-m-xylene	0.769	0.8042392	4.48

**12F0964-07** KCL-VBC-042

Analyte	Results		%RPD
Aroclor-1254 [2C]	2.8	2.465913	12.7
Aroclor-1260 [2C]	1.7	1.744065	2.56
Surrogates			
Tetrachloro-m-xylene	0.821	0.8362391	1.84
Decachlorobiphenyl	1.12	0.9826956	13.1

**12F0964-08** KCL-VBC-043

Analyte	Results		%RPD
Aroclor-1260	1.1	1.004904	9.04
Surrogates			
Decachlorobiphenyl	0.713	0.6333087	11.8
Tetrachloro-m-xylene	0.591	0.622987	5.27

**12F0964-09** KCL-VWP-044

Analyte	Results		%RPD
Aroclor-1260	0.34	0.34198	0.581
Surrogates			
Decachlorobiphenyl	2.35	2.17491	7.74
Tetrachloro-m-xylene	2.05	2.13538	4.08

12F0964-10		KCL-VWP-045	
Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	2.34	2.14223	8.82
Tetrachloro-m-xylene	2.04	2.11684	3.7

12F0964-11		KCL-VWP-046	
Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	2.25	2.0492	9.34
Tetrachloro-m-xylene	2.04	2.11835	3.77

12F0964-12		KCL-VBC-047	
Analyte	Results		%RPD
Aroclor-1254 [2C]	0.29	0.1963238	38.5
Aroclor-1260	0.46	0.4439286	3.56
Surrogates			
Tetrachloro-m-xylene	0.914	0.9507429	3.94
Decachlorobiphenyl	1.20	1.064833	11.9

12F0964-13		KCL-VBC-048	
Analyte	Results		%RPD
Aroclor-1254 [2C]	1.1	0.8964667	20.4
Aroclor-1260	0.36	0.3543524	1.58
Surrogates			
Decachlorobiphenyl	1.20	1.076305	10.9
Tetrachloro-m-xylene	0.946	0.9860286	4.14

12F0964-14		KCL-VBC-049	
Analyte	Results		%RPD
Aroclor-1260	0.82	0.8094318	1.3
Aroclor-1254 [2C]	3.3	3.008954	9.23
Surrogates			
Decachlorobiphenyl	1.13	1.001455	12.1
Tetrachloro-m-xylene	0.842	0.8596818	2.08

12F0964-15		KCL-VBC-050	
Analyte	Results		%RPD
Aroclor-1254 [2C]	1.1	0.7753909	34.6
Aroclor-1260 [2C]	0.40	0.3878727	3.08
Surrogates			
Tetrachloro-m-xylene	0.874	0.9031182	3.28
Decachlorobiphenyl	1.14	1.001764	12.9

12F0964-16		KCL-VBC-051	
Analyte	Results		%RPD
Aroclor-1254 [2C]	3.6	3.285341	9.14
Aroclor-1260 [2C]	0.82	0.8076136	1.52
Surrogates			
Tetrachloro-m-xylene	0.904	0.9125227	0.938
Decachlorobiphenyl	1.20	1.059636	12.4

12F0964-17		KCL-VBB-052	
Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.18	1.054682	11.2
Tetrachloro-m-xylene	0.978	1.005305	2.75

12F0964-18		KCL-VBB-053	
Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	0.969	0.8657727	11.3
Tetrachloro-m-xylene	0.848	0.8750454	3.14

**12F0964-19****KCL-VBBD-054**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.10	8.700869E-02	13.9
Surrogates			
Decachlorobiphenyl	0.955	0.8519261	11.4
Tetrachloro-m-xylene	0.830	0.8541	2.86

**12F0964-20****KCL-VBBQ-055**

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.43	1.27314	11.6
Tetrachloro-m-xylene	1.56	1.63209	4.52

**B054234-BLK1****Blank**

Analyte	Results		%RPD
Surrogates			
Tetrachloro-m-xylene	2.37	2.47306	4.26
Decachlorobiphenyl	2.71	2.44668	10.2

**B054234-BS1****LCS**

Analyte	Results		%RPD
Aroclor-1016	0.42	0.4236	0.853
Aroclor-1260	0.41	0.42543	3.69
Surrogates			
Decachlorobiphenyl	1.80	1.61139	11.1
Tetrachloro-m-xylene	1.44	1.50234	4.24

**B054234-BSD1****LCS Dup**

Analyte	Results		%RPD
Aroclor-1016	0.53	0.52275	1.38
Aroclor-1260	0.51	0.53417	4.63
Surrogates			
Decachlorobiphenyl	2.23	2.00036	10.9
Tetrachloro-m-xylene	1.85	1.93018	4.24

**B054247-BLK1****Blank**

Analyte	Results		%RPD
Aroclor-1254	0.77	0.86654	11.8
Surrogates			
Decachlorobiphenyl	3.24	3.80626	16.1
Tetrachloro-m-xylene	3.83	4.2387	10.1

**B054247-BS1****LCS**

Analyte	Results		%RPD
Aroclor-1260	2.9	3.37962	15.3
Aroclor-1016	3.4	4.5048	28
Surrogates			
Decachlorobiphenyl	2.57	3.14768	20.2
Tetrachloro-m-xylene	3.71	3.98808	7.22

**B054247-BSD1****LCS Dup**

Analyte	Results		%RPD
Aroclor-1016	3.4	4.28534	23
Aroclor-1260	2.7	3.02488	11.3
Surrogates			
Decachlorobiphenyl	1.98	2.39962	19.2
Tetrachloro-m-xylene	3.67	3.97394	7.95

**B054248-BLK1****Blank**

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.21	1.04831	14.3
Tetrachloro-m-xylene	0.909	0.936275	2.96

**B054248-BS1** LCS

Analyte	Results		%RPD
Aroclor-1016	0.26	0.268615	3.26
Aroclor-1260	0.28	0.27641	1.29
Surrogates			
Decachlorobiphenyl	1.16	1.0186	13
Tetrachloro-m-xylene	0.918	0.949115	3.33

**B054248-BSD1** LCS Dup

Analyte	Results		%RPD
Aroclor-1016	0.26	0.27632	6.09
Aroclor-1260	0.27	0.277255	2.65
Surrogates			
Decachlorobiphenyl	1.11	0.98339	12.1
Tetrachloro-m-xylene	0.944	0.977535	3.49

**B054248-MS1** Matrix Spike

Analyte	Results		%RPD
Aroclor-1016	0.22	0.23565	6.87
Aroclor-1260	0.24	0.2375045	1.05
Surrogates			
Decachlorobiphenyl	0.995	0.8899591	11.1
Tetrachloro-m-xylene	0.793	0.8233682	3.76

**B054248-MSD1** Matrix Spike Dup

Analyte	Results		%RPD
Aroclor-1016	0.20	0.2307636	14.3
Aroclor-1260	0.22	0.2342636	6.28
Surrogates			
Decachlorobiphenyl	0.947	0.8438318	11.5
Tetrachloro-m-xylene	0.740	0.7761864	4.77

**B054269-BLK1** Blank

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.47	1.27995	13.8
Tetrachloro-m-xylene	1.42	1.47809	4.01

**B054269-BS1** LCS

Analyte	Results		%RPD
Aroclor-1016	0.44	0.42396	3.71
Aroclor-1260	0.35	0.37505	6.91
Surrogates			
Decachlorobiphenyl	1.59	1.40537	12.3
Tetrachloro-m-xylene	1.42	1.46755	3.29

**B054269-BSD1** LCS Dup

Analyte	Results		%RPD
Aroclor-1260	0.41	0.42977	4.71
Aroclor-1016	0.49	0.46976	4.22
Surrogates			
Decachlorobiphenyl	1.65	1.46002	12.2
Tetrachloro-m-xylene	1.52	1.57997	3.87

**B054542-BLK1** Blank

Analyte	Results		%RPD
Surrogates			
Tetrachloro-m-xylene	4.25	3.98238	6.5
Decachlorobiphenyl	4.33	4.47154	3.22

**B054542-BS1** LCS

Analyte	Results		%RPD
Aroclor-1016	4.0	3.92016	2.02
Aroclor-1260	4.0	3.79796	5.18



Surrogates			
Tetrachloro-m-xylene	4.28	3.97408	7.41
Decachlorobiphenyl	4.40	3.83456	13.7

**B054542-BSD1**      LCS Dup

Analyte	Results		%RPD
Aroclor-1016	4.4	4.24342	3.62
Aroclor-1260	4.1	3.93122	4.2
Surrogates			
Tetrachloro-m-xylene	4.44	4.17568	6.14
Decachlorobiphenyl	4.25	4.43544	4.27

August 8, 2012

George Franklin  
Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810

Project Location: Yale - KCL, New Haven, CT  
Client Job Number:  
Project Number: 225540  
Laboratory Work Order Number: 12H0008

Enclosed are results of analyses for samples received by the laboratory on August 1, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley  
Project Manager

Woodard & Curran - Andover, MA  
35 New England Business Center  
Andover, MA 01810  
ATTN: George Franklin

REPORT DATE: 8/8/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 225540

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 12H0008

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Yale - KCL, New Haven, CT

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
KCL-CBC-200	12H0008-01	Product/Solid		SW-846 8082A	
KCL-VBC-201	12H0008-02	Product/Solid		SW-846 8082A	
KCL-VBC-202	12H0008-03	Product/Solid		SW-846 8082A	
KCL-VBC-203	12H0008-04	Product/Solid		SW-846 8082A	
KCL-VBC-204	12H0008-05	Product/Solid		SW-846 8082A	
KCL-VBC-205	12H0008-06	Product/Solid		SW-846 8082A	
KCL-CBC-206	12H0008-07	Product/Solid		SW-846 8082A	
KCL-VBC-207	12H0008-08	Product/Solid		SW-846 8082A	
KCL-CBC-208	12H0008-09	Product/Solid		SW-846 8082A	
KCL-CBC-209	12H0008-10	Product/Solid		SW-846 8082A	
KCL-CBC-210	12H0008-11	Product/Solid		SW-846 8082A	
KCL-CBC-211	12H0008-12	Product/Solid		SW-846 8082A	
KCL-CBC-213	12H0008-14	Product/Solid		SW-846 8082A	
KCL-CBC-214	12H0008-15	Product/Solid		SW-846 8082A	
KCL-FB-7.31.12	12H0008-16	Equipment Blank Water		SW-846 8082A	

**CASE NARRATIVE SUMMARY**

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

**SW-846 8082A**

**Qualifications:**

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Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.

**Analyte & Samples(s) Qualified:**

**Aroclor-1260 [2C]**

12H0008-11[KCL-CBC-210]

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Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. The higher result was reported.

**Analyte & Samples(s) Qualified:**

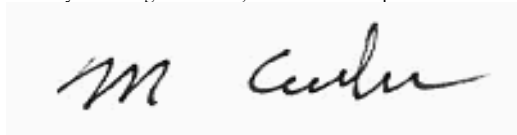
**Aroclor-1254 [2C]**

12H0008-14[KCL-CBC-213]

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson  
Laboratory Director

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-200

Sampled: 7/31/2012 09:55

Sample ID: 12H0008-01

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1254 [1]	0.37	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1260 [2]	0.33	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:25	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	104	30-150							
Decachlorobiphenyl [2]	104	30-150							
Tetrachloro-m-xylene [1]	97.7	30-150							
Tetrachloro-m-xylene [2]	95.7	30-150							

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-VBC-201

Sampled: 7/31/2012 10:22

Sample ID: 12H0008-02

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1221 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1232 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1242 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1248 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1254 [1]	1.3	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1260 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1262 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Aroclor-1268 [1]	ND	0.18	mg/Kg	2		SW-846 8082A	8/1/12	8/3/12 13:40	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	84.0	30-150							
Decachlorobiphenyl [2]	80.4	30-150							
Tetrachloro-m-xylene [1]	94.1	30-150							
Tetrachloro-m-xylene [2]	96.9	30-150							

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-VBC-202

Sampled: 7/31/2012 11:11

Sample ID: 12H0008-03

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1221 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1232 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1242 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1248 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1254 [2]	0.38	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1260 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1262 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Aroclor-1268 [1]	ND	0.095	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 21:51	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	57.6	30-150							
Decachlorobiphenyl [2]	57.0	30-150							
Tetrachloro-m-xylene [1]	53.9	30-150							
Tetrachloro-m-xylene [2]	54.0	30-150							

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-VBC-203

Sampled: 7/31/2012 11:47

Sample ID: 12H0008-04

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1221 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1232 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1242 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1248 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1254 [1]	0.54	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1260 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1262 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Aroclor-1268 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 22:04	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	101	30-150							
Decachlorobiphenyl [2]	100	30-150							
Tetrachloro-m-xylene [1]	94.1	30-150							
Tetrachloro-m-xylene [2]	92.1	30-150							



Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-VBC-204

Sampled: 7/31/2012 12:28

Sample ID: 12H0008-05

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1221 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1232 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1242 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1248 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1254 [2]	0.34	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1260 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1262 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Aroclor-1268 [1]	ND	0.091	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:21	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	105	30-150							
Decachlorobiphenyl [2]	104	30-150							
Tetrachloro-m-xylene [1]	101	30-150							
Tetrachloro-m-xylene [2]	99.6	30-150							

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-VBC-205

Sampled: 7/31/2012 12:51

Sample ID: 12H0008-06

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1254 [2]	0.47	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1260 [2]	0.27	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:34	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	105	30-150							
Decachlorobiphenyl [2]	104	30-150							
Tetrachloro-m-xylene [1]	99.2	30-150							
Tetrachloro-m-xylene [2]	97.2	30-150							

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-206

Sampled: 7/31/2012 13:21

Sample ID: 12H0008-07

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1254 [2]	0.53	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1260 [2]	0.36	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/2/12 23:47	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	94.8	30-150						8/2/12 23:47	
Decachlorobiphenyl [2]	93.8	30-150						8/2/12 23:47	
Tetrachloro-m-xylene [1]	100	30-150						8/2/12 23:47	
Tetrachloro-m-xylene [2]	98.1	30-150						8/2/12 23:47	

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-VBC-207

Sampled: 7/31/2012 13:50

Sample ID: 12H0008-08

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1254 [1]	0.68	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1260 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:00	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	96.3	30-150						8/3/12 0:00	
Decachlorobiphenyl [2]	95.7	30-150						8/3/12 0:00	
Tetrachloro-m-xylene [1]	98.3	30-150						8/3/12 0:00	
Tetrachloro-m-xylene [2]	97.1	30-150						8/3/12 0:00	

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Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-208

Sampled: 7/31/2012 14:11

Sample ID: 12H0008-09

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1254 [2]	0.31	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1260 [2]	0.40	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:13	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	88.5	30-150							
Decachlorobiphenyl [2]	88.4	30-150							
Tetrachloro-m-xylene [1]	87.7	30-150							
Tetrachloro-m-xylene [2]	87.1	30-150							

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Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-209

Sampled: 7/31/2012 14:33

Sample ID: 12H0008-10

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1254 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1260 [1]	0.15	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:26	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	99.6	30-150						8/3/12 0:26	
Decachlorobiphenyl [2]	98.9	30-150						8/3/12 0:26	
Tetrachloro-m-xylene [1]	89.9	30-150						8/3/12 0:26	
Tetrachloro-m-xylene [2]	89.8	30-150						8/3/12 0:26	

Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-210

Sampled: 7/31/2012 15:00

Sample ID: 12H0008-11

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1254 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1260 [2]	0.84	0.087	mg/Kg	1	O-03	SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:39	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	119	30-150							
Decachlorobiphenyl [2]	119	30-150							
Tetrachloro-m-xylene [1]	104	30-150							
Tetrachloro-m-xylene [2]	101	30-150							

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Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-211

Sampled: 7/31/2012 15:20

Sample ID: 12H0008-12

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1254 [2]	0.16	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1260 [2]	0.20	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 0:51	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	104	30-150							
Decachlorobiphenyl [2]	104	30-150							
Tetrachloro-m-xylene [1]	101	30-150							
Tetrachloro-m-xylene [2]	98.7	30-150							



Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-213

Sampled: 7/31/2012 15:50

Sample ID: 12H0008-14

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1254 [2]	0.41	0.087	mg/Kg	1	P-01	SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1260 [2]	0.54	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:17	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	119	30-150							
Decachlorobiphenyl [2]	119	30-150							
Tetrachloro-m-xylene [1]	107	30-150							
Tetrachloro-m-xylene [2]	103	30-150							

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Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-CBC-214

Sampled: 7/31/2012 15:50

Sample ID: 12H0008-15

Sample Matrix: Product/Solid

**Polychlorinated Biphenyls with 3540 Soxhlet Extraction**

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1221 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1232 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1242 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1248 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1254 [2]	0.30	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1260 [2]	0.39	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1262 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Aroclor-1268 [1]	ND	0.087	mg/Kg	1		SW-846 8082A	8/1/12	8/3/12 1:30	MJC
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	112	30-150						8/3/12 1:30	
Decachlorobiphenyl [2]	111	30-150						8/3/12 1:30	
Tetrachloro-m-xylene [1]	106	30-150						8/3/12 1:30	
Tetrachloro-m-xylene [2]	103	30-150						8/3/12 1:30	

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Project Location: Yale - KCL, New Haven, CT

Sample Description:

Work Order: 12H0008

Date Received: 8/1/2012

Field Sample #: KCL-FB-7.31.12

Sampled: 7/31/2012 17:00

Sample ID: 12H0008-16

Sample Matrix: Equipment Blank Water

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1221 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1232 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1242 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1248 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1254 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1260 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1262 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Aroclor-1268 [1]	ND	0.20	µg/L	1		SW-846 8082A	8/4/12	8/6/12 16:01	JMB
Surrogates	% Recovery	Recovery Limits	Flag						
Decachlorobiphenyl [1]	92.9	30-150						8/6/12 16:01	
Decachlorobiphenyl [2]	91.7	30-150						8/6/12 16:01	
Tetrachloro-m-xylene [1]	64.9	30-150						8/6/12 16:01	
Tetrachloro-m-xylene [2]	66.3	30-150						8/6/12 16:01	

**Sample Extraction Data****Prep Method: SW-846 3540C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
12H0008-01 [KCL-CBC-200]	B056240	2.30	10.0	08/01/12
12H0008-02 [KCL-VBC-201]	B056240	2.20	10.0	08/01/12
12H0008-03 [KCL-VBC-202]	B056240	2.10	10.0	08/01/12
12H0008-04 [KCL-VBC-203]	B056240	2.20	10.0	08/01/12
12H0008-05 [KCL-VBC-204]	B056240	2.20	10.0	08/01/12
12H0008-06 [KCL-VBC-205]	B056240	2.30	10.0	08/01/12
12H0008-07 [KCL-CBC-206]	B056240	2.30	10.0	08/01/12
12H0008-08 [KCL-VBC-207]	B056240	2.30	10.0	08/01/12
12H0008-09 [KCL-CBC-208]	B056240	2.30	10.0	08/01/12
12H0008-10 [KCL-CBC-209]	B056240	2.30	10.0	08/01/12
12H0008-11 [KCL-CBC-210]	B056240	2.30	10.0	08/01/12
12H0008-12 [KCL-CBC-211]	B056240	2.30	10.0	08/01/12
12H0008-14 [KCL-CBC-213]	B056240	2.30	10.0	08/01/12
12H0008-15 [KCL-CBC-214]	B056240	2.30	10.0	08/01/12

**Prep Method: SW-846 3510C-SW-846 8082A**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
12H0008-16 [KCL-FB-7.31.12]	B056412	1000	10.0	08/04/12

**QUALITY CONTROL**
**Polychlorinated Biphenyls By GC/ECD - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B056412 - SW-846 3510C</b>										
<b>Blank (B056412-BLK1)</b>										
Prepared: 08/04/12 Analyzed: 08/07/12										
Aroclor-1016	ND	0.20	µg/L							
Aroclor-1016 [2C]	ND	0.20	µg/L							
Aroclor-1221	ND	0.20	µg/L							
Aroclor-1221 [2C]	ND	0.20	µg/L							
Aroclor-1232	ND	0.20	µg/L							
Aroclor-1232 [2C]	ND	0.20	µg/L							
Aroclor-1242	ND	0.20	µg/L							
Aroclor-1242 [2C]	ND	0.20	µg/L							
Aroclor-1248	ND	0.20	µg/L							
Aroclor-1248 [2C]	ND	0.20	µg/L							
Aroclor-1254	ND	0.20	µg/L							
Aroclor-1254 [2C]	ND	0.20	µg/L							
Aroclor-1260	ND	0.20	µg/L							
Aroclor-1260 [2C]	ND	0.20	µg/L							
Aroclor-1262	ND	0.20	µg/L							
Aroclor-1262 [2C]	ND	0.20	µg/L							
Aroclor-1268	ND	0.20	µg/L							
Aroclor-1268 [2C]	ND	0.20	µg/L							
Surrogate: Decachlorobiphenyl	1.76		µg/L	2.00		88.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.70		µg/L	2.00		85.0	30-150			
Surrogate: Tetrachloro-m-xylene	1.08		µg/L	2.00		53.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.12		µg/L	2.00		55.8	30-150			
<b>LCS (B056412-BS1)</b>										
Prepared: 08/04/12 Analyzed: 08/07/12										
Aroclor-1016	0.46	0.20	µg/L	0.500		92.5	40-140			
Aroclor-1016 [2C]	0.55	0.20	µg/L	0.500		110	40-140			
Aroclor-1260	0.44	0.20	µg/L	0.500		87.7	40-140			
Aroclor-1260 [2C]	0.45	0.20	µg/L	0.500		90.4	40-140			
Surrogate: Decachlorobiphenyl	1.86		µg/L	2.00		93.2	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.83		µg/L	2.00		91.3	30-150			
Surrogate: Tetrachloro-m-xylene	1.15		µg/L	2.00		57.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.19		µg/L	2.00		59.7	30-150			
<b>LCS Dup (B056412-BSD1)</b>										
Prepared: 08/04/12 Analyzed: 08/07/12										
Aroclor-1016	0.44	0.20	µg/L	0.500		87.6	40-140	5.51	20	
Aroclor-1016 [2C]	0.46	0.20	µg/L	0.500		91.3	40-140	18.8	20	
Aroclor-1260	0.47	0.20	µg/L	0.500		94.5	40-140	7.44	20	
Aroclor-1260 [2C]	0.48	0.20	µg/L	0.500		95.5	40-140	5.56	20	
Surrogate: Decachlorobiphenyl	1.75		µg/L	2.00		87.5	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.72		µg/L	2.00		86.0	30-150			
Surrogate: Tetrachloro-m-xylene	1.22		µg/L	2.00		60.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	1.26		µg/L	2.00		63.2	30-150			

**QUALITY CONTROL**
**Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B056240 - SW-846 3540C**
**Blank (B056240-BLK1)**

Prepared: 08/01/12 Analyzed: 08/02/12

Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	0.971		mg/Kg	1.00		97.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.968		mg/Kg	1.00		96.8	30-150			
Surrogate: Tetrachloro-m-xylene	0.995		mg/Kg	1.00		99.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.973		mg/Kg	1.00		97.3	30-150			

**LCS (B056240-BS1)**

Prepared: 08/01/12 Analyzed: 08/02/12

Aroclor-1016	0.26	0.10	mg/Kg	0.250		103	40-140			
Aroclor-1016 [2C]	0.27	0.10	mg/Kg	0.250		109	40-140			
Aroclor-1260	0.26	0.10	mg/Kg	0.250		104	40-140			
Aroclor-1260 [2C]	0.30	0.10	mg/Kg	0.250		121	40-140			
Surrogate: Decachlorobiphenyl	1.07		mg/Kg	1.00		107	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.07		mg/Kg	1.00		107	30-150			
Surrogate: Tetrachloro-m-xylene	0.979		mg/Kg	1.00		97.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.957		mg/Kg	1.00		95.7	30-150			

**LCS Dup (B056240-BSD1)**

Prepared: 08/01/12 Analyzed: 08/02/12

Aroclor-1016	0.27	0.10	mg/Kg	0.250		109	40-140	5.04	30	
Aroclor-1016 [2C]	0.28	0.10	mg/Kg	0.250		111	40-140	1.77	30	
Aroclor-1260	0.25	0.10	mg/Kg	0.250		101	40-140	2.56	30	
Aroclor-1260 [2C]	0.29	0.10	mg/Kg	0.250		117	40-140	3.45	30	
Surrogate: Decachlorobiphenyl	1.00		mg/Kg	1.00		100	30-150			
Surrogate: Decachlorobiphenyl [2C]	1.00		mg/Kg	1.00		100	30-150			
Surrogate: Tetrachloro-m-xylene	1.02		mg/Kg	1.00		102	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.999		mg/Kg	1.00		99.9	30-150			

**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
O-03	Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.
P-01	Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. The higher result was reported.

# CERTIFICATIONS

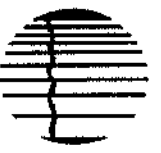
## Certified Analyses included in this Report

Analyte	Certifications
<b><i>SW-846 8082A in Product/Solid</i></b>	
Aroclor-1016	CT,NH,NY,ME,NC
Aroclor-1016 [2C]	CT,NH,NY,ME,NC
Aroclor-1221	CT,NH,NY,ME,NC
Aroclor-1221 [2C]	CT,NH,NY,ME,NC
Aroclor-1232	CT,NH,NY,ME,NC
Aroclor-1232 [2C]	CT,NH,NY,ME,NC
Aroclor-1242	CT,NH,NY,ME,NC
Aroclor-1242 [2C]	CT,NH,NY,ME,NC
Aroclor-1248	CT,NH,NY,ME,NC
Aroclor-1248 [2C]	CT,NH,NY,ME,NC
Aroclor-1254	CT,NH,NY,ME,NC
Aroclor-1254 [2C]	CT,NH,NY,ME,NC
Aroclor-1260	CT,NH,NY,ME,NC
Aroclor-1260 [2C]	CT,NH,NY,ME,NC
<b><i>SW-846 8082A in Water</i></b>	
Aroclor-1016	CT,NH,NY,RI,NC,ME
Aroclor-1016 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1221	CT,NH,NY,RI,NC,ME
Aroclor-1221 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1232	CT,NH,NY,RI,NC,ME
Aroclor-1232 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1242	CT,NH,NY,RI,NC,ME
Aroclor-1242 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1248	CT,NH,NY,RI,NC,ME
Aroclor-1248 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1254	CT,NH,NY,RI,NC,ME
Aroclor-1254 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1260	CT,NH,NY,RI,NC,ME
Aroclor-1260 [2C]	CT,NH,NY,RI,NC,ME
Aroclor-1262	NC
Aroclor-1262 [2C]	NC
Aroclor-1268	NC
Aroclor-1268 [2C]	NC



The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Public Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2013
RI	Rhode Island Department of Health	LAO00112	12/30/2012
NC	North Carolina Div. of Water Quality	652	12/31/2012
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2013
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	1381	12/14/2012



**con-test**  
ANALYTICAL LABORATORY

Phone: 413-525-2332  
Fax: 413-525-6405  
Email: info@contestlabs.com  
www.contestlabs.com

**CHAIN OF CUSTODY RECORD**

39 Spruce Street  
East Longmeadow, MA 01028

Page 1 of 2

Company Name: Woodard & Curran

Telephone: 978-557-8150

Address: 35 New England Business Center

Project # 225540

Andover, Mass. 01810

Client PO#

Attention: George Franklin

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Project Location: Yale-KCL, New Haven, CT

Fax #

Sampled By: Craig Goulet

Email: gfranklin@woodardcurran.com

Project Proposal Provided? (for billing purposes)  
☐ Yes ☐ No  
proposal date

Format: ☒ PDF ☐ EXCEL ☐ GIS  
☐ OTHER

**Collection**

☐ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	*Matrix Code	Final Code
G1	KCL-CBC-200	7.31.12/0955		X		S	U
G2	KCL-VBC-201	7.31.12/1022		X		S	U
G3	KCL-VBC-202	7.31.12/1111		X		S	U
G4	KCL-VBC-203	7.31.12/1147		X		S	U
G5	KCL-VBC-204	7.31.12/1228		X		S	U
G6	KCL-VBC-205	7.31.12/1251		X		S	U
G7	KCL-CBC-206	7.31.12/1321		X		S	U
G8	KCL-VBC-207	7.31.12/1350		X		S	U
G9	KCL-CBC-208	7.31.12/1411		X		S	U
G10	KCL-CBC-209	7.31.12/1433		X		S	U

Comments:

**Std. 5 day TAT**

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

**\*\*Matrix Code:**

GW = groundwater

WW = wastewater

DW = drinking water

A = air

S = soil/solid

SL = sludge

O = other

**\*\*Preservation**

I = Iced

H = HCL

M = Methanol

N = Nitric Acid

S = Sulfuric Acid

B = Sodium bisulfate

X = Na hydroxide

T = Na thiosulfate

O = Other

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**ANALYSIS REQUESTED**

PCB 8082

(Extraction by Meth. 3540C Soxhlet)

# of Containers

\*\* Preservation

\*\*\* Container Code

Disolved Meta

☐ Field Filtered

☐ Lab to Filter

\*\*\*Cont. Code:

A=amber glass

G=glass

P=plastic

ST=sterile

V= vial

S=summary can

T=tiedar bag

O=Other



Phone: 413-525-2332  
Fax: 413-525-6405  
Email: info@contestlabs.com  
www.contestlabs.com

# CHAIN OF CUSTODY RECORD

39 Spruce Street  
East Longmeadow, MA 01028

Page 2 of 2

Company Name: Woodard & Curran

Telephone: 978-557-8150

Address: 35 New England Business Center

Project # 225540

Andover, Mass. 01810

Client PO#

Attention: George Franklin

DATA DELIVERY (check all that apply)  
☐ FAX ☒ EMAIL ☐ WEBSITE

Project Location: Yale-KCL, New Haven, CT

Fax #

Sampled By: Craig Goulet

Email: gfranklin@woodardcurran.com

Project Proposal Provided? (for billing purposes)

☐ Yes ☐ No (proposal date)

Format: ☒ PDF ☐ EXCEL ☐ OGIS  
☐ OTHER

Collection ☐ "Enhanced Data Package"

Con-Test Lab ID

Beginning Date/Time

Ending Date/Time

Composite

Grab

\*Matrix Date

PCB 8082

(Extraction by Meth. 3540C Soxhlet)

ANALYSIS REQUESTED

# of Containers

\*\* Preservation

\*\*\* Container Cod

Dissolved Meta

☐ Field Filtered

☐ Lab to Filter

\*\*\*Cont. Code:

A=amber glass

G=glass

P=plastic

ST=sterile

V=vial

S=summa can

T=tetral bag

O=Other

\*\*Preservation

I=iced

H=HCL

M=Methanol

N=Nitric Acid

S=Sulfuric Acid

B=Sodium bisulfate

X=Na hydroxide

T=Na thiosulfate

O=Other

\*Matrix Code:

GW=groundwater

WW=wastewater

DW=drinking water

A=air

S=soil/solid

SL=sludge

O=other

LAB PROVIDED IN

Std. 5 day TAT

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box.

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by (signature)

8/5/12

Date/Time: 8/1/12

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other ☐ RUSH ☐ 14-Day ☐ 48-Hr

Detection Limit Requirements

Is your project MCP or RCP?

MCP Form Required

RCP Form Required

MA State DW Form Required

PWSID #

NEIAC & AIHA-LAP, LLC

Accredited

WBE/DBE Certified

Received by (signature)

8/5/12

Date/Time: 8/1/12

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other ☐ RUSH ☐ 14-Day ☐ 48-Hr

Detection Limit Requirements

Is your project MCP or RCP?

MCP Form Required

RCP Form Required

MA State DW Form Required

PWSID #

NEIAC & AIHA-LAP, LLC

Accredited

WBE/DBE Certified

Received by (signature)

8/5/12

Date/Time: 8/1/12

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other ☐ RUSH ☐ 14-Day ☐ 48-Hr

Detection Limit Requirements

Is your project MCP or RCP?

MCP Form Required

RCP Form Required

MA State DW Form Required

PWSID #

NEIAC & AIHA-LAP, LLC

Accredited

WBE/DBE Certified

Received by (signature)

8/5/12

Date/Time: 8/1/12

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other ☐ RUSH ☐ 14-Day ☐ 48-Hr

Detection Limit Requirements

Is your project MCP or RCP?

MCP Form Required

RCP Form Required

MA State DW Form Required

PWSID #

NEIAC & AIHA-LAP, LLC

Accredited

WBE/DBE Certified

Received by (signature)

8/5/12

Date/Time: 8/1/12

Turnaround ☐ 7-Day ☐ 10-Day ☒ Other ☐ RUSH ☐ 14-Day ☐ 48-Hr

Detection Limit Requirements

Is your project MCP or RCP?

MCP Form Required

RCP Form Required

MA State DW Form Required

PWSID #

NEIAC & AIHA-LAP, LLC

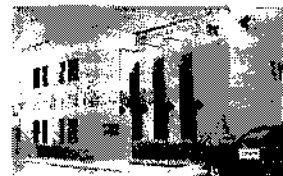
Accredited

WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

39 Spruce St.  
East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
www.contestlabs.com



## Sample Receipt Checklist

CLIENT NAME: Woodard & Curran RECEIVED BY: KKM DATE: 8-1-12

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples?

If not, explain:

3) Are all the samples in good condition?

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 5.5C

5) Are there Dissolved samples for the lab to filter?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No  
(Walk-In clients only) if not already approved  
Client Signature: \_\_\_\_\_

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No N/A

### Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber	<u>1</u>	8 oz amber/clear jar	
500 mL Amber		4 oz amber <u>clear</u> jar	<u>15</u>
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_

Doc# 277 # Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_

Rev. 3 May 2012 # Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen:

**12G1033-02RE1 GH-VBC-154**

Analyte	Results		%RPD
Aroclor-1254	1.8	1.3643	27.5
Surrogates			
Decachlorobiphenyl	1.01	0.9844454	2.56
Tetrachloro-m-xylene	0.766	0.7791273	1.7

**12H0008-01 KCL-CBC-200**

Analyte	Results		%RPD
Aroclor-1254	0.37	0.4531478	20.2
Aroclor-1260 [2C]	0.33	0.2785609	16.9
Surrogates			
Decachlorobiphenyl	0.907	0.9045479	0.271
Tetrachloro-m-xylene	0.850	0.8323783	2.09

**12H0008-02 KCL-VBC-201**

Analyte	Results		%RPD
Aroclor-1254	1.3	1.226236	5.84
Surrogates			
Tetrachloro-m-xylene	0.856	0.8807363	2.85
Decachlorobiphenyl	0.764	0.7313545	4.37

**12H0008-03 KCL-VBC-202**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.38	0.3510905	7.91
Surrogates			
Tetrachloro-m-xylene	0.514	0.5144667	0.0908
Decachlorobiphenyl	0.548	0.5429572	0.924

**12H0008-04 KCL-VBC-203**

Analyte	Results		%RPD
Aroclor-1254	0.54	0.5010863	7.48
Surrogates			
Decachlorobiphenyl	0.921	0.9109273	1.1
Tetrachloro-m-xylene	0.856	0.8370727	2.24

**12H0008-05 KCL-VBC-204**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.34	0.3009909	12.2
Surrogates			
Decachlorobiphenyl	0.954	0.9469454	0.742
Tetrachloro-m-xylene	0.919	0.9051545	1.52

**12H0008-06 KCL-VBC-205**

Analyte	Results		%RPD
Aroclor-1260 [2C]	0.27	0.2094652	25.3
Aroclor-1254 [2C]	0.47	0.4551565	3.21
Surrogates			
Decachlorobiphenyl	0.910	0.9030218	0.77
Tetrachloro-m-xylene	0.862	0.8454609	1.94

**12H0008-07 KCL-CBC-206**

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.53	0.483487	9.18
Aroclor-1260 [2C]	0.36	0.3086826	15.3
Surrogates			
Decachlorobiphenyl	0.825	0.8156826	1.14
Tetrachloro-m-xylene	0.869	0.8530043	1.86

**12H0008-08 KCL-VBC-207**

Analyte	Results		%RPD
Aroclor-1254	0.68	0.6195305	9.31

Surrogates			
Decachlorobiphenyl	0.838	0.8320218	0.716
Tetrachloro-m-xylene	0.855	0.8445913	1.22

#### 12H0008-09 KCL-CBC-208

Analyte	Results		%RPD
Aroclor-1260 [2C]	0.40	0.3513	13
Aroclor-1254 [2C]	0.31	0.2679957	14.5
Surrogates			
Decachlorobiphenyl	0.770	0.7688348	0.151
Tetrachloro-m-xylene	0.763	0.7574609	0.729

#### 12H0008-10 KCL-CBC-209

Analyte	Results		%RPD
Aroclor-1260	0.15	0.1778044	17
Surrogates			
Decachlorobiphenyl	0.866	0.8599957	0.696
Tetrachloro-m-xylene	0.782	0.7806957	0.167

#### 12H0008-11 KCL-CBC-210

Analyte	Results		%RPD
Aroclor-1260 [2C]	0.84	0.7572869	10.4
Surrogates			
Decachlorobiphenyl	1.03	1.033191	0.309
Tetrachloro-m-xylene	0.902	0.8813479	2.32

#### 12H0008-12 KCL-CBC-211

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.16	0.1271435	22.9
Aroclor-1260 [2C]	0.20	0.1750348	13.3
Surrogates			
Tetrachloro-m-xylene	0.880	0.8581391	2.52
Decachlorobiphenyl	0.908	0.907213	0.0867

#### 12H0008-14 KCL-CBC-213

Analyte	Results		%RPD
Aroclor-1254 [2C]	0.41	0.2216217	59.6
Aroclor-1260 [2C]	0.54	0.4794435	11.9
Surrogates			
Decachlorobiphenyl	1.04	1.031491	0.822
Tetrachloro-m-xylene	0.927	0.8994131	3.02

#### 12H0008-15 KCL-CBC-214

Analyte	Results		%RPD
Aroclor-1260 [2C]	0.39	0.3325652	15.9
Aroclor-1254 [2C]	0.30	0.2082087	36.1
Surrogates			
Decachlorobiphenyl	0.974	0.9613826	1.3
Tetrachloro-m-xylene	0.921	0.8970913	2.63

#### 12H0008-16 KCL-FB-7.31.12

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.86	1.83362	1.43
Tetrachloro-m-xylene	1.30	1.32611	1.99

**B056240-BLK1****Blank**

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	0.971	0.96821	0.288
Tetrachloro-m-xylene	0.995	0.973475	2.19

**B056240-BS1****LCS**

Analyte	Results		%RPD
Aroclor-1016	0.26	0.27143	4.3
Aroclor-1260	0.26	0.303235	15.4
Surrogates			
Tetrachloro-m-xylene	0.979	0.957375	2.23
Decachlorobiphenyl	1.07	1.06503	0.466

**B056240-BSD1****LCS Dup**

Analyte	Results		%RPD
Aroclor-1260	0.25	0.292945	15.8
Aroclor-1016	0.27	0.27627	2.3
Surrogates			
Tetrachloro-m-xylene	1.02	0.999185	2.06
Decachlorobiphenyl	1.00	0.99977	0.023

**B056240-MS1****Matrix Spike**

Analyte	Results		%RPD
Aroclor-1016	0.28	0.42326	40.7
Aroclor-1260	0.94	1.034485	9.57
Surrogates			
Decachlorobiphenyl	1.07	1.05718	1.21
Tetrachloro-m-xylene	0.992	0.962785	2.99

**B056240-MSD1****Matrix Spike Dup**

Analyte	Results		%RPD
Aroclor-1016	0.26	0.371965	35.4
Aroclor-1260	0.79	0.8712	9.78
Surrogates			
Tetrachloro-m-xylene	0.921	0.896805	2.66
Decachlorobiphenyl	1.02	1.012275	0.76

**B056412-BLK1****Blank**

Analyte	Results		%RPD
Surrogates			
Decachlorobiphenyl	1.76	1.69976	3.48
Tetrachloro-m-xylene	1.08	1.11619	3.3

**B056412-BS1****LCS**

Analyte	Results		%RPD
Aroclor-1016	0.46	0.5513	18.1
Aroclor-1260	0.44	0.45178	2.64
Surrogates			
Decachlorobiphenyl	1.86	1.82638	1.82
Tetrachloro-m-xylene	1.15	1.19338	3.7

**B056412-BSD1****LCS Dup**

Analyte	Results		%RPD
Aroclor-1016	0.44	0.45664	3.71
Aroclor-1260	0.47	0.47763	1.61
Surrogates			
Tetrachloro-m-xylene	1.22	1.26418	3.56
Decachlorobiphenyl	1.75	1.72066	1.69

## **APPENDIX C: PERIMETER DUST MONITORING PLAN**



## APPENDIX C –PERIMETER DUST MONITORING PLAN

Airborne particulate matter (PM) consists of many different substances suspended in air in the form of particles (solids or liquid droplets) that vary widely in size. Inhalation hazards may be presented if the intake of these particles includes intake of vapors and/or contaminated dust. Particles less than 10 micrometers in diameter (PM-10), which include both respirable fine (less than 2.5 micrometers) and coarse (less than 10 micrometers) dust particles, pose the greatest potential health concern because they can pass through the nose and throat and get into the lungs.

During the performance of the planned remediation activities, particulate matter in the form of potentially PCB-affected dust may be generated. The greatest potential for the generation of affected dust is during saw cutting for waste segregation and removal of concrete coated with ductwork sealant.

As indicated in the remediation plan, the main dust control mechanism to be employed on the project will be the use of engineering controls (e.g. wet techniques and misting), polyethylene containment structures, and personal protective equipment (PPE). In addition, particulate air monitoring will be conducted during intrusive or dust-generating activities in the Support Work Zone (SWZ) and perimeter to the SWZ. The SWZ is the area just outside of the active work areas, in designated safe work zones or support zones. Particulate air monitoring will determine if fugitive dust particles are present in the ambient air within the designated SWZ and/or perimeter during active removal activities. A direct-reading particulate meter will be used to monitor airborne particulate concentrations during site activities. Particulate concentrations shall be utilized as an indirect indicator of exposures to on-site receptors.

Dust concentrations in the SWZ will be measured using a suitable real time aerosol particulate monitor capable of determining ambient air fugitive dust concentrations to 0.001 milligrams per cubic meter (mg/m<sup>3</sup>). Air monitoring shall be conducted while active removal activities are occurring and at a frequency of one reading every two hours during active dust generating activities. Prior to the active removal actions and at periodic points during the project, air monitoring readings will be recorded to document background particulate matter concentrations.

If total particulate concentrations in the SWZ exceed the action limits (as specified below and incorporating background readings) and are sustained (i.e. greater than 5 minutes), then the following actions will be taken:

- Engineering controls (HEPA filtration, containment, etc.) will be inspected to insure proper operation;
- Work practices will be evaluated;
- Additional dust suppression techniques to mitigate fugitive dust shall be initiated.

Any additional dust suppression techniques shall involve the application of a fine mist of water over the area creating the fugitive dust condition. The water shall be applied either by hand held sprayers, sprinklers, or water hoses/misters. In the event that the total airborne particulate cannot be maintained below the action limit in the SWZ, then work activities shall be ceased until sustained readings are below the action limit or the SWZ designation is re-evaluated.

OSHA has published the following permissible exposure limits (8 hour time weighted average) for air contaminants (29 CFR 1910.1000):

Air Contaminant	PEL (8-hour TWA)
Total Dust	15 mg/m <sup>3</sup>
Respirable Dust Fraction	5 mg/m <sup>3</sup>
PCBs (42% Chlorine)	1 mg/m <sup>3</sup>
PCBs (54% Chlorine)	0.5 mg/m <sup>3</sup>

In addition, EPA has established a National Ambient Air Quality Standard for PM-10 of 0.150 mg/m<sup>3</sup> (24-hr average).

## APPENDIX C –PERIMETER DUST MONITORING PLAN

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A total airborne particulate action limit has been established for the building material removal work to be conducted at the Kline Chemistry Laboratory with consideration of the specific receptors, PCB concentrations, work activities, and OSHA permissible exposure limits. The action limit applies only to dust monitoring within the SWZ and perimeter to the SWZ; an action limit has not been set for the active work zones (exclusion zones) as engineering controls and PPE will be used within these zones.

Given the occupancy and use of surrounding buildings (classroom and office buildings) and the anticipated PCB concentration in dust that may be generated during abatement activities, a conservative action limit of 0.1 mg/m<sup>3</sup> above background will be maintained during site work. Dust monitoring at a location representative of background air conditions (i.e. a location upwind without active remedial activities in progress) will be conducted at the same frequency as SWZ monitoring to obtain data representative of real-time background conditions. The action limit will be used to determine if and when additional engineered controls and/or work stoppages would be necessary.

## **APPENDIX D: MANUFACTURER'S PRODUCT INFORMATION**

**Product Data Sheet**

Edition 7.2003

Identification no. 601

Sikagard 62

**Sikagard® 62**

High-build, protective, solvent-free,  
colored epoxy coating

<b>Description</b>	Sikagard 62 is a 2-component, 100% solids, moisture-tolerant epoxy resin. It produces a high-build, protective, dampproofing and waterproofing vapor-barrier system.
<b>Where to Use</b>	Use as a high build, corrosion-resistant, protective coating, as a protective lining for secondary containment structures or as a seamless flooring system.
<b>Advantages</b>	<ul style="list-style-type: none"> <li>■ Exceptional tensile strength.</li> <li>■ Good chemical resistance for long-term protection.</li> <li>■ Convenient A:B = 1:1 mixing ratio.</li> <li>■ Easy, paint-like viscosity.</li> <li>■ Available in 3 standard colors: gray, red, and tan. Special color matches available upon request.</li> <li>■ Excellent bonding to all common structural substrates.</li> <li>■ Super abrasion resistance for long-term wear.</li> <li>■ Sikagard 62 gray, after cure, is approved for contact with potable water.</li> <li>■ Material is USDA certifiable.</li> </ul>
<b>Coverage</b>	Approximately 150-250 sq. ft./gal. depending on condition of substrate.
<b>Packaging</b>	4 gal. units; 1 qt. units, 12/case.
<b>How to Use</b>	
<b>Surface Preparation</b>	<p>Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants.</p> <p><b>Preparation Work: Concrete</b> - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blastcleaning or equivalent mechanical means.</p> <p><b>Steel</b> - Should be cleaned and prepared thoroughly by blastcleaning.</p>
<b>Mixing</b>	<b>Pre-mix each component.</b> Proportion equal parts by volume of Components 'A' and 'B' into a clean mixing container. Mix with a low-speed (400-600 rpm) drill using a Sika paddle for 3 minutes, until uniform in color.
<b>Application</b>	Apply coating using high-quality roller, brush or spray. Two coats are recommended. Apply second coat as soon as the first coat is tack-free and the traffic of application will not damage the first coat. The

**Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)**

<b>Shelf Life</b>	2 years in original, unopened containers.		
<b>Storage Conditions</b>	Store dry at 40°-95°F (4°-35°C). <b>Condition material to 65°-75°F (18°-24°C) before using.</b>		
<b>Color</b>	Gray, red, tan.		
<b>Mixing Ratio</b>	Component 'A' : Component 'B'=1:1 by volume.		
<b>Viscosity (Mixed)</b>	Approximately 3,500 cps.		
<b>Pot Life</b>	Approximately 35 to 40 minutes. (60 gram mass).		
<b>Tack-Free Time</b>	Approximately 4 hours.		
<b>Open Time</b>	Light foot traffic: 5-7 hours. Rubber-wheel traffic: 8-10 hours.		
<b>Immersion and Chemical Exposure</b>	Minimum cure: 3 days		
<b>Tensile Properties (ASTM D-638)</b>			
<b>14 day</b>	Tensile Strength	5,400 psi (37.3 MPa)	
	Elongation at Break	2.7 %	
<b>Abrasion (ASTM D-1044) (Taber Abrader)</b>			
<b>7 day</b>	Weight loss, 1,000 cycles (H-22 wheel, 1,000 gm weight)	0.61 gm	
<b>Abrasion Resistance (ASTM D-968)</b>			
<b>14 day</b>	Abrasion Coefficient	51 liters/mil.	
<b>Adhesion (ASTM D-3359)</b>			
<b>1 day</b>	Adhesion Classification	4A	
<b>Water Absorption (ASTM D-570)</b>			
<b>7 day</b>	(24 hour immersion)	0.1%	



second coat, however, **must** be applied within 48 hours since a longer delay will require additional surface preparation.

**Do not spray with slip resistant granules mixed into the coating. For use as a seamless flooring system, consult Technical Service.**

<b>Limitations</b>	<ul style="list-style-type: none"> <li>■ Minimum substrate and ambient temperature for application 50°F (10°C).</li> <li>■ Do not apply over wet, glistening surface.</li> <li>■ Material is a vapor barrier after cure.</li> <li>■ Do not apply to porous surfaces exhibiting moisture-vapor transmission during the application. Consult Technical Service.</li> <li>■ Minimum age of concrete prior to application is 21-28 days, depending on curing and drying conditions.</li> <li>■ Do not apply to exterior, on-grade substrates.</li> <li>■ Use oven-dried aggregate only.</li> <li>■ Do not thin with solvents.</li> <li>■ Color may alter due to variations in lighting and/or UV exposure.</li> <li>■ On 'green or 'damp' concrete, EpoCem can be used as a pore filler to reduce vapor drive and potential osmotic blistering.</li> </ul>
<b>Caution</b>	<p><b>Component 'A' - Irritant; Sensitizer</b> - Contains epoxy resin. Can cause sensitization after prolonged or repeated contact. Skin and eye irritant. Vapors may cause respiratory irritation. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of high vapor concentrations, use an appropriate NIOSH approved respirator. Remove contaminated clothing.</p> <p><b>Component 'B' - Sensitizer</b> - Contains amines. Contact with eyes or skin may cause severe burns. Can cause sensitization after prolonged or repeated contact. Skin and eye irritant. Vapors may cause respiratory irritation. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of high vapor concentrations, use an appropriate NIOSH approved respirator. Remove contaminated clothing.</p>
<b>First Aid</b>	<p><b>Eyes:</b> Hold eyelids apart and flush thoroughly with water for 15 minutes. <b>Skin:</b> Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. <b>Inhalation:</b> Remove person to fresh air. <b>Ingestion:</b> Do not induce vomiting. <b>In all cases, contact a physician immediately if symptoms persist.</b></p>
<b>Clean Up</b>	Ventilate area. Confine spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state and federal regulations. Uncured material can be removed with approved solvent. Cured material can only be removed mechanically.

## Chemical Resistance

Specimen: Two Coats - 10 mils Total  
Cured 10 days  
Substrate: asbestos cement

Chemical	Test Temp.	Storage Time and Evaluation				
		1 Day	1 Month	2 Months	6 Months	12 Months
Water	75°F (24°C)	A	A	A	A	A
	100°F (38°C)	A	A	A	A	A
	140°F (60°C)	A	A	A	A, D	A, D
Sodium Chloride Solution (Saturated)	75°F (24°F) 100°F (38°C)	A A	A A	A A	A A	A A
Sodium Hydroxide 30%	75°F (24°C)	A	A	A	A	A
Cement Water (Saturated)	75°F (24°C)	A	A	A	A	A
Detergent Solution (5% Ajax)	75°F (24°C)	A	A	A	A	A
	140°F (60°C)	A	A	A	A, D	A, D
Hydrochloric Acid 10%	75°F (24°C)	A	A	A	A	A
Sulfuric Acid 10%	75°F (24°C)	A	A	A	B	B
Oxalic Acid 10%	75°F (24°C)	A	A, D	A, D	A, D	A, D
Citric Acid 10%	75°F (24°C)	A	A, D	A, D	A, D	A, D
Fuel Oil (Home Heating)	75°F (24°C)	A	A	A	A	A, D
Gasoline (Unleaded)	75°F (24°C)	A	A	A	A	A, D
Iso-Octane	75°F (24°C)	A	A	A	A	A, D
Toluol	75°F (24°C)	A	A	A	A	A, D
Silage	75°F (24°C)	A	A	A, D	A, D	B, D
Synthetic Silage	75°F (24°C)	A	A	B, D	B, D	B, D
Ethyl Alcohol	75°F (24°C)	A	C	-	-	-

A: Resistant in permanent contact  
B: Temporary resistance  
C: Destroyed  
D: Discolored

KEEP CONTAINER TIGHTLY CLOSED  
NOT FOR INTERNAL CONSUMPTION

KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Sika warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Technical Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor.

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Quality Certification Numbers: Lyndhurst: FM 69711 (ISO 9000), FM 70421 (QS 9000), Marion: FM 69715, Kansas City: FM 69107, Santa Fe Springs: FM 69408

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**DIVISION 9 - FINISHES**  
**Section 09900 Coatings****Part 1 - General****1.01 Summary**

- A. This specification describes the coating of substrates with a vapor-barrier, solvent-free, protective, dampproofing, waterproofing, moisture-insensitive, epoxy resin coating.

**1.02 Quality Assurance**

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

**1.03 Delivery, Storage, and Handling**

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

**1.04 Job Conditions**

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (5°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

**1.05 Submittals**

- A. Submit two copies of manufacturer's literature, to include: Product Data Sheets and appropriate Material Safety Data Sheets (MSDS).

**1.06 Warranty**

- A. Provide a written warranty from the manufacturer against defects of materials for a period of five (5) years, beginning with date of substantial completion of the project.

## **Part 2 - Products**

### **2.01 Manufacturer**

- A. **Sikagard 62**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

### **2.02 Materials**

- A. Epoxy resin coating:
  - 1. Component A shall be a epoxy resin of diglycidylether of bisphenol A containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
  - 1. Component B shall be primarily a reaction product of a selected amine blend with an epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents, pigments, and accelerators.
  - 2. The ratio of Component A: Component B shall be 1:1 by volume
- B. Granules for slip-resistance shall be supplied by the manufacturer of the specified product and shall be able to be mixed into the coating and shall not settle during application.

### **2.03 Performance Criteria**

- A. Typical Properties of the mixed epoxy resin coating:
  - 1. Application Life: Approximately 20 - 25 minutes
  - 2. Tack FreeTime: Approximately 4 hours
  - 3. Color: red, grey, tan
  - 4. Solids: 100% VOC g/l : 0.00 Max.
  - 5. Immersion & Chemical Exposure: min. Cure 3 Days
- B. Typical Properties of the cured epoxy resin coating:
  - 1. Water Absorption (ASTM D-570) at 7days: 1.0% max. (2 hour boil)
  - 2. Elongation (ASTM D-522) at 14 days: 5% min.
  - 3. Abrasion Resistance (ASTM D-968) at 14 days: 51 liters/mil
  - 4. Adhesion classification (ASTM 3359) at 14 days: 4A min.
  - 5. Abrasion (Taber Abrader) at 7 days: Weight loss: 0.65 gm. max. (H-22 wheel; 1000 gm weight; 1000 cycles)
  - 6. Tensile Properties (ASTM D-638) at 14 days: Tensile Strength 6400 psi (44.1 Mpa) / Elongation at Break 2.7%
  - 7. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
    - a. 2 Day (dry cure): 2000 psi min.
    - b. 14 Day (moist cure): 1500 psi min.
  - 8. The coating shall have United States Department of Agriculture approval.

**Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.**

## **Part 3 – Execution**

### **3.01 Surface Preparation**

- A. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for coatings.

### **3.02 Mixing and Application**

- A. Mixing: Premix each component. Proportion equal parts by volume of Component A and Component B into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (35 minutes at 73F). To minimize color difference, blend two complete Components B's together. Use only one of the blended Component B's to mix with a Component A. After the first Component B has been used, blend the second Component B with a new Component B and repeat the above procedure for the entire application.
- B. Placement Procedure: The epoxy resin coating shall be applied only to approved, prepared surfaces with high-quality brushes, rollers, or spray equipment. Coating shall be applied at ambient and substrate temperatures between 50 and 90F. Application thickness shall be between 4-7 mils per coat. Subsequent coats shall be applied within 48 hours of the previous coat. Care is to be taken on vertical and overhead surfaces to avoid sags or runs. If this occurs, it must be sanded out and the area re-coated. If coating of horizontal surfaces that will receive traffic is specified, a slip-resistant aggregate, Sikagard 62 Granules, shall be incorporated into the mixed epoxy resin coating at 1/2 lb./gallon or as directed by the engineer.
- C. When applying the coating, if possible never stop the application until the entire surface has been coated. If possible always discontinue at an edge, corner, or joint. Never let a previously coated film dry. Always coat into wet film. Always apply the coating at a 45° angle to an edge, corner, or joint.
- E. Adhere to all limitations and cautions for the epoxy resin as stated in the manufacturers printed literature.

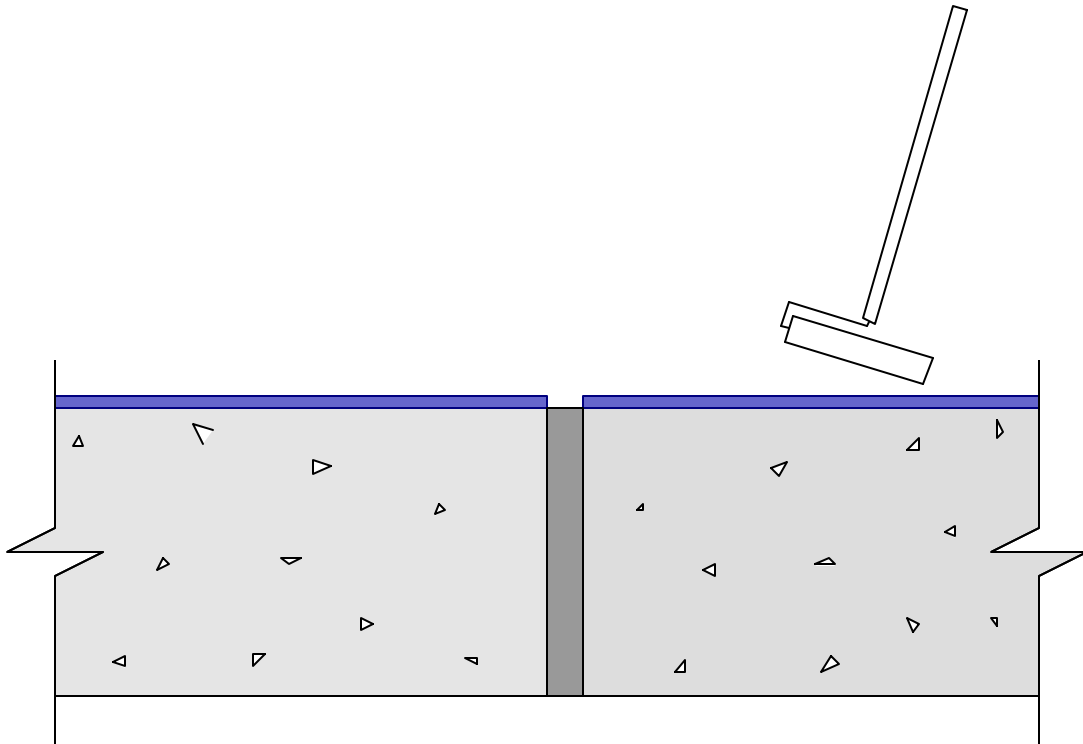
### **3.03 Cleaning**

- A. The uncured epoxy resin coating can be cleaned from tools with an approved solvent. The cured epoxy resin coating can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.



# SC-054

# Sikagard 62 Coating



1. Apply Sikagard 62 with high quality brushes or rollers. Care should be taken to avoid sags or runs.
2. When applying the coating, never stop the application until the entire surface has been coated.
3. Subsequent coats shall be applied within 48 hours of the previous coat.
4. For a slip-resistant surface, aggregate shall be incorporated into the mixed epoxy resin coating at a ½ lb./gal.

Note: When applying Sikagard 62 always end at an edge, corner or joint. Do not apply 62 directly over joint filler.





# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part A (ALL COLORS)

### HMIS

HEALTH	2
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

### 1. Product And Company Identification

#### Supplier

Sika Corporation  
201 Polito Ave  
Lyndhurst, NJ 07071

Company Contact: EHS Department  
Telephone Number: 201-933-8800  
FAX Number: 201-933-9379  
Web Site: www.sikausa.com

#### Manufacturer

Sika Corporation  
201 Polito Ave  
Lyndhurst, NJ 07071

Company Contact: EHS Department  
Telephone Number: 201-933-8800  
FAX Number: 201-933-9379  
Web Site: www.sikausa.com

#### Supplier Emergency Contacts & Phone Number

CHEMTREC: 800-424-9300  
INTERNATIONAL: 703-527-3887

#### Manufacturer Emergency Contacts & Phone Number

CHEMTREC: 800-424-9300  
INTERNATIONAL: 703-527-3887

Issue Date: 11/27/2007

Product Name: Sikagard 62 - Part A (ALL COLORS)

CAS Number: Not Established

Chemical Family: Epoxy Compound

MSDS Number: 4220

Product Code: 0601130

### 2. Composition/Information On Ingredients

Ingredient Name	CAS Number	Percent Of Total Weight
AROMATIC HYDROCARBON BLEND	68477-31-6	
EPOXY RESIN	25085-99-8	

### 3. Hazards Identification

#### Eye Hazards

EYE IRRITANT.

#### Skin Hazards

MAY CAUSE SKIN IRRITATION. PROLONGED AND/OR REPEATED CONTACT WITH SKIN MAY CAUSE AN ALLERGIC REACTION/SENSITIZATION.

#### Ingestion Hazards

ACUTELY TOXIC. HARMFUL IF ASPIRATED INTO LUNGS.

# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part A (ALL COLORS)

### 3. Hazards Identification - Continued

#### Inhalation Hazards

MAY CAUSE RESPIRATORY TRACT IRRITATION.

### 4. First Aid Measures

#### Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

#### Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING.  
IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

#### Ingestion

DILUTE WITH WATER. DO NOT INDUCE VOMITING. CONTACT PHYSICIAN.

#### Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

### 5. Fire Fighting Measures

**Flash Point:** 355 °F

**Autoignition Point:** N/AV °F

#### Fire And Explosion Hazards

NONE KNOWN

#### Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

#### Fire Fighting Instructions

In the event of a fire, firefighters should wear full protective clothing and NIOSH-approved self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode.

### 6. Accidental Release Measures

WEARING PROPER PROTECTIVE CLOTHING, CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL.  
SHOVEL INTO CLOSABLE CONTAINERS. AVOID CONTACT.

### 7. Handling And Storage

#### Handling And Storage Precautions

STORE IN A COOL AREA. KEEP CONTAINERS TIGHTLY CLOSED.

#### Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

### 8. Exposure Controls/Personal Protection

#### Engineering Controls

Use with adequate general and local exhaust ventilation. Refer to the current edition of "Industrial Ventilation: A Manual of Recommended Practice" published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

#### Eye/Face Protection

Safety glasses with side shields or goggles.

#### Skin Protection

AVOID SKIN CONTACT. WEAR LONG SLEEVE SHIRT AND LONG PANTS.  
WEAR CHEMICAL RESISTANT GLOVES.

# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part A (ALL COLORS)

### 8. Exposure Controls/Personal Protection - Continued

#### **Respiratory Protection**

A respirator protection program that meets 29 CFR 1910.134 requirement must be followed whenever workplace conditions warrant a respirator's use.

#### **Other/General Protection**

WASH THOROUGHLY AFTER HANDLING.

#### **Ingredient(s) - Exposure Limits**

AROMATIC HYDROCARBON BLEND

ACGIH TLV: NOT ESTABLISHED

OSHA PEL: NOT ESTABLISHED

NTP: NO

IARC: NO

EPOXY RESIN

ACGIH TLV: NOT ESTABLISHED

OSHA PEL: NOT ESTABLISHED

NTP: NO

IARC: NO

### 9. Physical And Chemical Properties

#### **Appearance**

LIGHT YELLOW LIQUID

#### **Odor**

MILD AROMATIC ODOR

**Chemical Type:** Mixture

**Physical State:** Liquid

**Melting Point:** N/AV °F

**Boiling Point:** N/AV °F

**Specific Gravity:** 1.14

**Percent Volatiles:** 0%

**Vapor Pressure:** N/AV

**Vapor Density:** > AIR

**Solubility:** N/AV

**Evaporation Rate:** SLOWER THAN ETHER

VOC Content (A+B): < 100 grams / liter

### 10. Stability And Reactivity

**Stability:** STABLE

**Hazardous Polymerization:** WILL NOT OCCUR

#### **Conditions To Avoid (Stability)**

NONE KNOWN

#### **Incompatible Materials**

STRONG OXIDIZING MATERIALS, ACIDS AND BASES.

#### **Hazardous Decomposition Products**

CO, CO<sub>2</sub>, ALDEHYDES AND OTHER ORGANICS

#### **Conditions To Avoid (Polymerization)**

FIRES/EXOTHERM WHEN CURING IN MASS.

# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part A (ALL COLORS)

### 11. Toxicological Information

#### Conditions Aggravated By Exposure

EYE DISEASE, SKIN DISORDERS AND ALLERGIES, CHRONIC RESPIRATORY DISEASE

### 12. Ecological Information

No Data Available...

### 13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

### 14. Transport Information

#### Proper Shipping Name

NOT REGULATED UNDER D.O.T.

### 15. Regulatory Information

#### U.S. Regulatory Information

All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

#### SARA Hazard Classes

Acute Health Hazard  
Chronic Health Hazard

#### SARA Section 313 Notification

This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

### 16. Other Information

#### HMIS Rating

Health: 2

Fire: 1

Reactivity: 0

PPE: C

#### Revision/Preparer Information

MSDS Preparer: EHS Department

MSDS Preparer Phone Number: 201-933-8800

This MSDS Supersedes A Previous MSDS Dated: 02/20/2007

### Disclaimer

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# ***M A T E R I A L   S A F E T Y   D A T A   S H E E T***

## **Sikagard 62 - Part A (ALL COLORS)**

### **Disclaimer - Continued**

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# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part B (ALL COLORS)

### HMIS

HEALTH	3
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

### 1. Product And Company Identification

#### Supplier

Sika Corporation  
201 Polito Ave  
Lyndhurst, NJ 07071

Company Contact: EHS Department  
Telephone Number: 201-933-8800  
FAX Number: 201-933-9379  
Web Site: www.sikausa.com

#### Manufacturer

Sika Corporation  
201 Polito Ave  
Lyndhurst, NJ 07071

Company Contact: EHS Department  
Telephone Number: 201-933-8800  
FAX Number: 201-933-9379  
Web Site: www.sikausa.com

#### Supplier Emergency Contacts & Phone Number

CHEMTREC: 800-424-9300  
INTERNATIONAL: 703-527-3887

#### Manufacturer Emergency Contacts & Phone Number

CHEMTREC: 800-424-9300  
INTERNATIONAL: 703-527-3887

DOT NON CORROSIVE AS PER 11/3/97 TESTING

Issue Date: 11/27/2007

Product Name: Sikagard 62 - Part B (ALL COLORS)

CAS Number: Not Established

Chemical Family: Amine

MSDS Number: 4221

Product Code: 0601792

### 2. Composition/Information On Ingredients

Ingredient Name	CAS Number	Percent Of Total Weight
AROMATIC HYDROCARBON BLEND	68477-31-6	
BENZYL ALCOHOL	100-51-6	
PROPRIETARY BLEND OF ALIPHATIC & CYCLIC AMINES	Not Establis	
SILICA, QUARTZ	14808-60-7	

\*EXPOSURE TO SILICA, QUARTZ IS APPLICABLE ONLY IF CURED WITH PART "A" AND SANDED.

### 3. Hazards Identification

#### Eye Hazards

CONTACT MAY CAUSE SEVERE IRRITATION AND PAIN AND MAY CAUSE BURNS, NECROSIS AND PERMANENT INJURY. MAY CAUSE VISUAL DISTURBANCES, CORNEA DAMAGE, DAMAGE TO THE OPTIC NERVE OR BLINDNESS.



# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part B (ALL COLORS)

### 3. Hazards Identification - Continued

#### Skin Hazards

CONTACT MAY CAUSE SEVERE IRRITATION AND PAIN AND MAY CAUSE BURNS, NECROSIS AND PERMANENT INJURY. PROLONGED AND/OR REPEATED CONTACT WITH SKIN MAY CAUSE ANALLERGIC REACTION/SENSITIZATION.

#### Ingestion Hazards

ACUTELY TOXIC. HARMFUL IF ASPIRATED INTO LUNGS.

#### Inhalation Hazards

MAY CAUSE RESPIRATORY TRACT IRRITATION. OVEREXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS.

### 4. First Aid Measures

#### Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

#### Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

#### Ingestion

DILUTE WITH WATER. DO NOT INDUCE VOMITING. CONTACT PHYSICIAN.

#### Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

### 5. Fire Fighting Measures

**Flash Point:** >220 °F

**Autoignition Point:** N/AV °F

#### Fire And Explosion Hazards

EXPOSURE TO HEAT BUILDS UP PRESSURE IN CLOSED CONTAINERS.

#### Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

#### Fire Fighting Instructions

In the event of a fire, firefighters should wear full protective clothing and NIOSH-approved self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode.

### 6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. VENTILATE AREA. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL AND TRANSFER INTO SUITABLE CONTAINERS. AVOID CONTACT.

### 7. Handling And Storage

#### Handling And Storage Precautions

STORE IN A COOL, DRY, WELL VENTILATED AREA. KEEP CONTAINERS TIGHTLY CLOSED.

#### Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part B (ALL COLORS)

### 8. Exposure Controls/Personal Protection

#### Engineering Controls

Use with adequate general and local exhaust ventilation.

#### Eye/Face Protection

Safety glasses with side shields or goggles.

#### Skin Protection

AVOID SKIN CONTACT. WEAR LONG SLEEVE SHIRT AND LONG PANTS. CHEMICAL RESISTANT GLOVES.

#### Respiratory Protection

A respirator protection program that meets 29 CFR 1910.134 requirement must be followed whenever workplace conditions warrant a respirator's use. In areas where the Permissible Exposure Limits are exceeded, use a properly fitted NIOSH-approved respirator.

#### Other/General Protection

WASH THOROUGHLY AFTER HANDLING.

#### Ingredient(s) - Exposure Limits

AROMATIC HYDROCARBON BLEND

ACGIH TLV: NOT ESTABLISHED

OSHA PEL: NOT ESTABLISHED

IARC: NO

NTP: NO

PROPRIETARY BLEND OF ALIPHATIC & CYCLIC AMINES

ACGIH TLV: NOT ESTABLISHED

OSHA PEL: NOT ESTABLISHED

IARC: NO

NTP: NO

SILICA, QUARTZ

ACGIH TLV-TWA 0.1 mg/m3 (Notice of Intended Change)

ACGIH TLV-TWA 0.05 mg/m3 (Proposed)

OSHA PEL-TWA 30/%SiO<sub>2</sub>+2 mg/m3

OSHA PEL-TWA 10/%SiO<sub>2</sub>+2 mg/m3

OSHA PEL-TWA 250/%SiO<sub>2</sub>+5 mppcf

### 9. Physical And Chemical Properties

#### Appearance

VISCOUS LIQUID (VARIOUS COLORS)

#### Odor

AMINE ODOR

**Chemical Type:** Mixture

**Physical State:** Liquid

**Melting Point:** N/AV °F

**Boiling Point:** N/AV °F

**Specific Gravity:** 1.70

**Vapor Pressure:** N/AV

**Vapor Density:** >AIR

**Solubility:** N/AV

**Evaporation Rate:** SLOWER THAN ETHER

VOC Content (A+B): < 100 grams / liter

# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part B (ALL COLORS)

### 10. Stability And Reactivity

**Stability:** STABLE

**Hazardous Polymerization:** WILL NOT OCCUR

**Conditions To Avoid (Stability)**

NONE KNOWN

**Incompatible Materials**

STRONG OXIDIZING AGENTS, ACID AND EPOXY RESINS UNDER UNCONTROLLED CONDITIONS

**Hazardous Decomposition Products**

CO, CO<sub>2</sub>, OXIDES OF NITROGEN

### 11. Toxicological Information

**Miscellaneous Toxicological Information**

**Conditions Aggravated By Exposure**

EYE DISEASE, SKIN DISORDERS AND ALLERGIES, CHRONIC RESPIRATORY CONDITIONS

**Ingredient(s) - Carginogenicity**

SILICA, QUARTZ

NTP - Listed On The National Toxicology Program

Listed In The IARC Monographs

### 12. Ecological Information

No Data Available...

### 13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

### 14. Transport Information

**Proper Shipping Name**

NOT REGULATED BY D.O.T.

### 15. Regulatory Information

**U.S. Regulatory Information**

All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

**SARA Hazard Classes**

Acute Health Hazard

Chronic Health Hazard

**SARA Section 313 Notification**

This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

**State Regulations**

WARNING: This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm.

# MATERIAL SAFETY DATA SHEET

## Sikagard 62 - Part B (ALL COLORS)

### 15. Regulatory Information - Continued

#### Ingredient(s) - State Regulations

BENZYL ALCOHOL

New Jersey - Workplace Hazard

Pennsylvania - Workplace Hazard

Massachusetts - Hazardous Substance

SILICA, QUARTZ

New Jersey - Workplace Hazard

Pennsylvania - Workplace Hazard

California - Proposition 65

Massachusetts - Hazardous Substance

### 16. Other Information

#### HMIS Rating

Health: 3

Fire: 1

Reactivity: 0

PPE: C

#### Revision/Preparer Information

MSDS Preparer: EHS Department

MSDS Preparer Phone Number: 201-933-8800

This MSDS Supersedes A Previous MSDS Dated: 02/20/2007

### Disclaimer

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## Product Data Sheet

Edition 1.24.2011

Identification no. 604

Sikagard 670W

# Sikagard® 670W

Water dispersed, acrylic, protective,  
anti-carbonation coating

<b>Description</b>	Sikagard 670W is a water dispersed colored, acrylic, protective coating. Sikagard 670W prevents moisture ingress, is water vapor permeable and provides an excellent carbonation barrier.
<b>Where to Use</b>	Above grade, exterior application on buildings or civil engineering structures. It is designed to aesthetically enhance and protect concrete and other masonry substrates subject to normal hydrothermal movement. Protective, decorative seal coat for SikaColor and Sikadur Balcony Systems.
<b>Advantages</b>	<ul style="list-style-type: none"><li>■ Easy to apply.</li><li>■ Extremely resistant to dirt pick-up and mildew.</li><li>■ Excellent resistance to carbon dioxide and other aggressive gas diffusion.</li><li>■ Excellent UV resistance.</li><li>■ Excellent weathering resistance.</li><li>■ Prevents ingress of chlorides.</li><li>■ Cost effective protection.</li><li>■ Vapor permeable; allows each way water vapor diffusion (breathable).</li></ul>
<b>Coverage</b>	Theoretical per coat: 300 sq. ft./gal. Wet film thickness: 5 mils. Dry film thickness: 2.5 mils. Normal coating system is two coats minimum at a total nominal dry film thickness of 5 mils. Consumption is obviously dependent on substrate. In addition, allowance must be made for surface profile, variations in applied film thickness, loss and waste. A third coat may be necessary where opacity is reduced through thinning of the first coat, on dense substrates or with very bright color shades.
<b>Packaging</b>	5 gallon, re-closable plastic pails.
<b>How to Use</b>	
<b>Surface preparation</b>	All surfaces to be coated must be clean, dry, laitance free, sound and frost-free with curing compound residues and any other contaminants removed. An open textured sandpaper-like surface is ideal (CSP-3). Where necessary, surfaces should be prepared mechanically by blast cleaning or high pressure waterjetting. Allow adequate time for drying. Bugholes, cracks or irregularities of substrate should be filled and leveled with SikaTop, Sika MonoTop leveling mortar or Sikagard Surface Fillers as appropriate.

### Typical Data (Material and curing conditions at 73°F (23°C) and 50% R.H.)

<b>Shelf Life</b>	1 year in original, unopened container.		
<b>Storage Conditions</b>	Store dry at 40°-95°F (4°-35°C). <b>Condition material to 60°-75°F before using.</b> Protect from freezing. If frozen, discard.		
<b>Colors</b>	463 standard colors. Custom color-matching available.		
<b>Pot Life</b>	Indefinite, provided proper care is taken in protecting the system from moisture, freezing, contamination, or evaporation.		
<b>Solids Content</b>	<b>by weight:</b> 60%	<b>by volume:</b> 46%	
<b>Waiting and Drying Times</b>			
<b>Between Coats:</b>		<b>Rain Resistant After</b>	<b>Final Drying</b>
45°F (7°C) approx. 90 min.		approx. 5 hours	approx. 24 hours
68°F (20°C) approx. 30 min.		approx. 1 hour	approx. 4 hours
85°F (30°C) approx. 20 min.		approx. 40 min.	approx. 3 hours
<b>Water Vapor Diffusion (at 5 mils. = 120 microns dry film thickness)</b>			
$\mu$ - value H <sub>2</sub> O (diffusion coefficient) = 3,140			
SdH <sub>2</sub> O (equivalent air thickness) = 1.3 ft. (0.4 m)			
<b>Carbon Dioxide Diffusion (at 5 mils. = 120 microns dry film thickness)</b>			
$\mu$ - value CO <sub>2</sub> (diffusion coefficient) = 1,100,000			
SdCO <sub>2</sub> (equivalent air thickness) = 433 ft. (132 m.)			
Equivalent concrete thickness (Sc) = approximately 13 inches (33 cm.)			
<b>Moisture Vapor Permeability (ASTM E-96)</b>		17.9 Perms	
<b>Flame Spread and Smoke Development (ASTM E-84-94)</b>			
Flame Spread: 0		Smoke Development: 5	Class Rating: A
<b>Weathering (ASTM G-26)</b>		2000 hours	Excellent, no chalking or cracking.

Construction

**Sika**®

<b>Priming</b>	All porous areas or concrete with excessive porosity should be primed using Sikagard 552W Primer or SikaLatex R to allow easy application of Sikagard 670W.
<b>Mixing</b>	Stir thoroughly to ensure uniformity using a low speed (400-600 rpm) drill and Sika paddle. To minimize color variation when using multiple batches, blend two batches of Sikagard 670W. Use one pail and maintain the second pail to repeat this procedure (boxing) for the entire application.
<b>Application</b>	<p>Any areas of glass or other surfaces should be masked. Recommended application temperatures (ambient and substrate) 45°-95°F (5°-35°C). Sikagard 670W can be applied by brush, roller, or spray over entire area moving in one direction. Allow a minimum of 20-90 minutes prior to re-coating. At lower temperatures and high humidity, waiting time will be prolonged. At higher temperatures, work carefully to maintain a 'wet' edge. Sikagard 670W is usually applied using a short nap lambs wool roller. Sikagard 670W is particularly suitable for application by spray using the most standard spray painting equipment. As with all coatings, jobsite mock-ups should always be completed to confirm acceptability of workmanship and material.</p> <p><b>Note:</b> To achieve a dry film thickness of 4-6 mils., two uniform coats should be anticipated. On porous substrates, a third coat may be necessary and on particularly dense substrates, the first coat should be thinned 10% by volume with water. A third coat may then be needed for opacity.</p>
<b>Limitations</b>	<ul style="list-style-type: none"> <li>■ Do not use over moving cracks.</li> <li>■ Substrate must be dry prior to the application.</li> <li>■ Minimum age of concrete prior to the application is 14 days, depending on curing and drying conditions (moisture content must be below 5%).</li> <li>■ Minimum age of SikaTop or Sika MonoTop thin layer renderings is 3 days prior to the application of 670W (moisture content must be below 5%).</li> <li>■ Sikagard 670W should not be applied at relative humidities greater than 90%, or if rain is forecast within the specified rain resistance period.</li> <li>■ Allow sufficient time for the substrate to dry after rain or other inclement conditions.</li> <li>■ Product must be protected from freezing. If frozen, discard.</li> <li>■ Not designed for use as a vehicular traffic bearing surface.</li> <li>■ During application, regular monitoring of wet film thickness and material consumption is advised to ensure that the correct layer thickness is achieved.</li> <li>■ When overcoating existing coatings, compatibility and adhesion testing is recommended.</li> <li>■ Do not store Sikagard 670W in direct sunlight for prolonged periods.</li> </ul>
<b>Caution Warning</b>	Avoid breathing vapors. Use only with adequate ventilation. May cause respiratory irritation and headaches.
<b>Irritant</b>	Skin, eye, and respiratory irritant; avoid contact. Use of safety goggles and chemical resistant gloves is recommended. Remove contaminated clothing.
<b>First Aid</b>	In case of eye contact, flush with water for 15 minutes, contact physician immediately. For skin contact, wash skin with soap water. For respiratory problems, remove person to fresh air. Wash clothing before re-use.
<b>Spill Clean Up</b>	Confine spill, ventilate closed areas, and collect with absorbent material. Dispose of in accordance with current, applicable, local, state, and federal regulations. Uncured material can be removed with water. Cured material can only be removed mechanically.

**KEEP CONTAINER TIGHTLY CLOSED • KEEP OUT OF REACH OF CHILDREN • NOT FOR INTERNAL CONSUMPTION • FOR INDUSTRIAL USE ONLY**

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**Sika Mexicana S.A. de C.V.**  
Carretera Libre Celaya Km. 8.5  
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Spec Component: SC-060-03/10

Sikagard 670W

**DIVISION 9 - FINISHES**  
**Section 09880 Protective Coatings**

**Part 1 - General**

**1.01 Summary**

- A. This specification describes the coating of substrates with an anti-carbonation, protective coating.

**1.02 Quality Assurance**

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by manufacturer's representative
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

**1.03 Delivery, Storage, and Handling**

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

**1.04 Job Conditions**

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45°F (7°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

**1.05 Submittals**

- A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).
- B. Submit copy of Certificate of Approved Contractor status by manufacturer.

**1.06 Warranty**

- A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

## Part 2 - Products

### 2.01 Manufacturer

- A. **Sikagard 670W**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.
- B. **Sikagard Elastic Textured Base Coat**, manufactured by Sika Corporation 1682 Marion Williamsport Road, Ohio 43302 is considered to conform to requirements of this specification
- C. **Sikagard 552W Primer or SikaLatex R**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

### 2.02 Materials

- A. Protective Acrylic Coating:
  - 1. Product shall be 100% Acrylic Emulsion with the following properties:
    - a. Non-vapor barrier
    - b. Must resist ingress of chlorides
    - c. Must resist ingress of carbon dioxide
    - d. The material shall be non-combustible, both before and after cure.
- B. Elastomeric Acrylic Textured Base Coating:
  - 1. Product shall be 100% Acrylic Emulsion with the following properties:
    - a. Water vapor permeable
    - b. Can bridge dynamically moving cracks
    - c. Crack bridging properties maintained at low temperatures
- B. Surface Conditioner / Adhesion Promoter:
  - 1. Product shall be a water-based acrylic surface conditioner/ primer and promote adhesion of acrylic coatings.
    - a. Solids content 12.5% - 20% by volume
    - b. Recoat time 4- 24 hours

### 2.03 Performance Criteria

- A. Properties of the protective acrylic coating:
  - 1. Pot Life: indefinite
  - 2. Tack Free Time 1 Hour @ 73°F, 50% Relative Humidity. Final Cure < 24 Hours
  - 3. Carbon Dioxide Diffusion:  $\mu\text{CO}_2$  1,100,000 Carbon Dioxide Diffusion Resistance at 5 mils (120 microns)  $\text{SdCO}_2 = 433 \text{ ft (132 m)}$  equivalent air thickness. i.e. Approx. 13-in. of standard concrete cover.
  - 4. Water Vapor Diffusion:  $\mu\text{H}_2\text{O}$  13,140. Water Vapor Diffusion Resistance at 5 mils (120 microns)  $\text{SdH}_2\text{O} = 1.3 \text{ ft (0.4 m)}$  equivalent air thickness.
  - 5. Moisture Vapor permeability (ASTM E96) 17.9 perms
  - 6. Solids content: By weight: 60% By Volume: 46%
  - 7. Flame spread and smoke development (ASTM E-84-94)
    - a. Flame Spread 0
    - b. Smoke Development 5
    - c. Class Rating A
  - 8. Resistance to wind driven rain (TT-C-555B): No passage of water through coating.



**Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.**

## **Part 3 – Execution**

### **3.01 Surface Preparation**

- A. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for coatings and fall within CSP1 to CSP3.

### **3.02 Mixing and Application**

- A. Mixing: Stir materials to ensure uniformity using a low speed (400-600 rpm) drill and paddle. To minimize color variation, blend two batches of material.(boxing)
- B. Coating Application: Apply by brush, roller, or spray over entire area moving in one direction. A minimum of two coats are required. Each coat should be applied at a rate not to exceed 250-sq. ft. per gallon. Total dry film thickness shall be a minimum 2.5 – 3 dry mils per coat. Allow a minimum of 1 hour prior to re-coating.
- C. When applying the coating, never stop the application until the entire surface has been coated. Always stop application at an edge, corner, or joint. Never let a previously coated film dry; always coat into a wet film. Always apply the coating at a 45° angle to an edge, corner, or joint.
- D. If substrate has been previously coated and presents a “chalky” condition, apply 1 coat of Sikagard 552W or Sika Latex R, primer/surface conditioner by brush, roller, or spray at a rate not to exceed 300 sq. ft. per gallon.
- E. Adhere to all limitations and cautions for the acrylic coating in the manufacturer's printed literature.

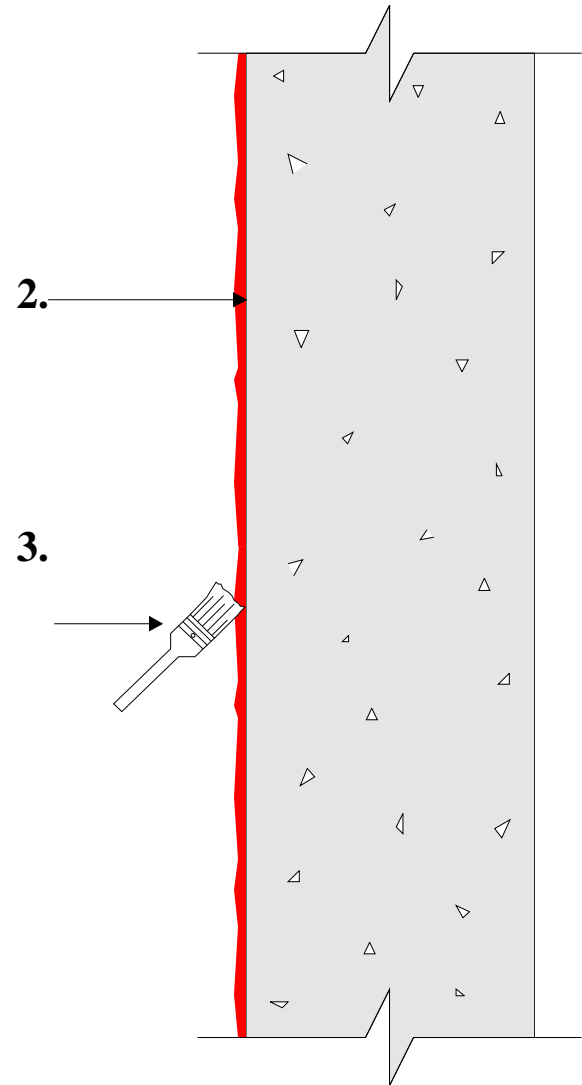
### **3.03 Cleaning**

- A. The uncured acrylic coating can be cleaned from tools with water. The cured acrylic coating can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

# SC-060

## Sikagard 670W®, Anti-Carbonation, Protective Coating

1. Substrate must be dry, clean and sound.
2. Condition surface with Sikagard 552W or SikaLatex R(as needed)
3. Apply Sikagard 670W by brush, roller or spray over entire area moving in one direction.



Concrete Restoration Systems by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071

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# MATERIAL SAFETY DATA SHEET

## Sikagard 670W - All Colors

### HMIS

HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

### 1. Product And Company Identification

#### Supplier

Sika Corporation  
201 Polito Ave  
Lyndhurst, NJ 07071

Company Contact: EHS Department  
Telephone Number: 201-933-8800  
FAX Number: 201-933-9379  
Web Site: www.sikausa.com

#### Manufacturer

Sika Corporation  
201 Polito Ave  
Lyndhurst, NJ 07071

Company Contact: EHS Department  
Telephone Number: 201-933-8800  
FAX Number: 201-933-9379  
Web Site: www.sikausa.com

#### Supplier Emergency Contacts & Phone Number

CHEMTREC: 800-424-9300  
INTERNATIONAL: 703-527-3887

#### Manufacturer Emergency Contacts & Phone Number

CHEMTREC: 800-424-9300  
INTERNATIONAL: 703-527-3887

Issue Date: 08/14/2007

Product Name: Sikagard 670W - All Colors  
CAS Number: Not Established  
MSDS Number: 4154  
Product Code: 0690543

### 2. Composition/Information On Ingredients

Ingredient Name	CAS Number	Percent Of Total Weight
CALCIUM CARBONATE	471-34-1	
TALC	14807-96-6	
TITANIUM DIOXIDE	13463-67-7	

### 3. Hazards Identification

#### Eye Hazards

EYE IRRITANT.

#### Skin Hazards

MAY CAUSE A REVERSIBLE INFLAMMATORY EFFECT ON SKIN OR TISSUE AT THE SITE OF CONTACT.

#### Ingestion Hazards

NOT NORMALLY INGESTED.

#### Inhalation Hazards

MAY CAUSE A REVERSIBLE INFLAMMATORY EFFECT ON THE UPPER RESPIRATORY SYSTEM.

# MATERIAL SAFETY DATA SHEET

## Sikagard 670W - All Colors

### 4. First Aid Measures

#### Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

#### Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

#### Ingestion

CONSULT PHYSICIAN.

#### Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

### 5. Fire Fighting Measures

**Flash Point:** >200 °F

#### Fire And Explosion Hazards

NONE KNOWN

#### Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

#### Fire Fighting Instructions

Firefighters should wear self-contained breathing apparatus and full protective gear.

### 6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. ELIMINATE SOURCES OF IGNITION. VENTILATE AREA. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL. TRANSFER INTO A SUITABLE CONTAINER.

### 7. Handling And Storage

#### Handling And Storage Precautions

VENTILATION SHOULD BE SUFFICIENT TO REDUCE AIR CONTAMINANTS TO BELOW PELs. IF PELs ARE EXCEEDED WEAR APPROPRIATE, PROPERLY FITTED NIOSH/MSHA APPROVED RESPIRATOR.

#### Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

### 8. Exposure Controls/Personal Protection

#### Engineering Controls

Use with adequate general and local exhaust ventilation.

#### Eye/Face Protection

Safety glasses with side shields or goggles.

#### Skin Protection

AVOID SKIN CONTACT. WEAR LONG SLEEVE SHIRT AND LONG PANTS. CHEMICAL RESISTANT RUBBER OR PLASTIC GLOVES.

#### Respiratory Protection

In areas where the P.E.L.s are exceeded, use a properly fitted NIOSH-approved respirator.

#### Ingredient(s) - Exposure Limits

CALCIUM CARBONATE  
ACGIH TLV-TWA 10 mg/m3

# MATERIAL SAFETY DATA SHEET

## Sikagard 670W - All Colors

### 8. Exposure Controls/Personal Protection - Continued

#### Ingredient(s) - Exposure Limits - Continued

OSHA PEL-TWA 15 mg/m3  
OSHA PEL-TWA 5 mg/m3  
TALC  
ACGIH TLV-TWA 2 mg/m3  
OSHA PEL-TWA 20 mppcf  
TITANIUM DIOXIDE  
ACGIH TLV-TWA 10 mg/m3  
OSHA PEL-TWA 15 mg/m3

### 9. Physical And Chemical Properties

#### Appearance

THICK EMULSION IN COLORS

#### Odor

LATEX

**Chemical Type:** Mixture

**Physical State:** Liquid

**Melting Point:** N/A °F

**Boiling Point:** N/AV °F

**Specific Gravity:** 1.35

**Percent Volatiles:** N/AV

**Percent VOCs:** 4.1%

**Packing Density:** 11.24 lb / gallon

**Vapor Density:** N/AV

**pH Factor:** N/AV

**Solubility:** MISCIBLE

VOC Content: 47.8 grams/ liter (USEPA Method 24)

### 10. Stability And Reactivity

**Stability:** STABLE

**Hazardous Polymerization:** WILL NOT OCCUR

#### Conditions To Avoid (Stability)

NONE KNOWN

#### Incompatible Materials

NONE KNOWN

### 11. Toxicological Information

#### Miscellaneous Toxicological Information

This product contains chemical(s) known to the state of California to cause cancer, birth defects or other reproductive harms.

#### Ingredient(s) - Carginogenicity

TALC  
Listed In The IARC Monographs

### 12. Ecological Information

No Data Available...

# MATERIAL SAFETY DATA SHEET

## Sikagard 670W - All Colors

### 13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

### 14. Transport Information

#### Proper Shipping Name

NOT REGULATED BY D.O.T.

### 15. Regulatory Information

#### U.S. Regulatory Information

All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

#### SARA Hazard Classes

Acute Health Hazard

#### SARA Section 313 Notification

This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

#### Ingredient(s) - State Regulations

CALCIUM CARBONATE

Pennsylvania - Workplace Hazard

TALC

New Jersey - Workplace Hazard

Pennsylvania - Workplace Hazard

Massachusetts - Hazardous Substance

TITANIUM DIOXIDE

New Jersey - Workplace Hazard

Pennsylvania - Workplace Hazard

New York City - Hazardous Substance

### 16. Other Information

#### HMIS Rating

Health: 1

Fire: 1

Reactivity: 0

PPE: C

#### Revision/Preparer Information

MSDS Preparer: EHS Department

MSDS Preparer Phone Number: 201-933-8800

This MSDS Supersedes A Previous MSDS Dated: 08/13/2007

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# **M A T E R I A L   S A F E T Y   D A T A   S H E E T**

## **Sikagard 670W - All Colors**

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